R. G. Havelock
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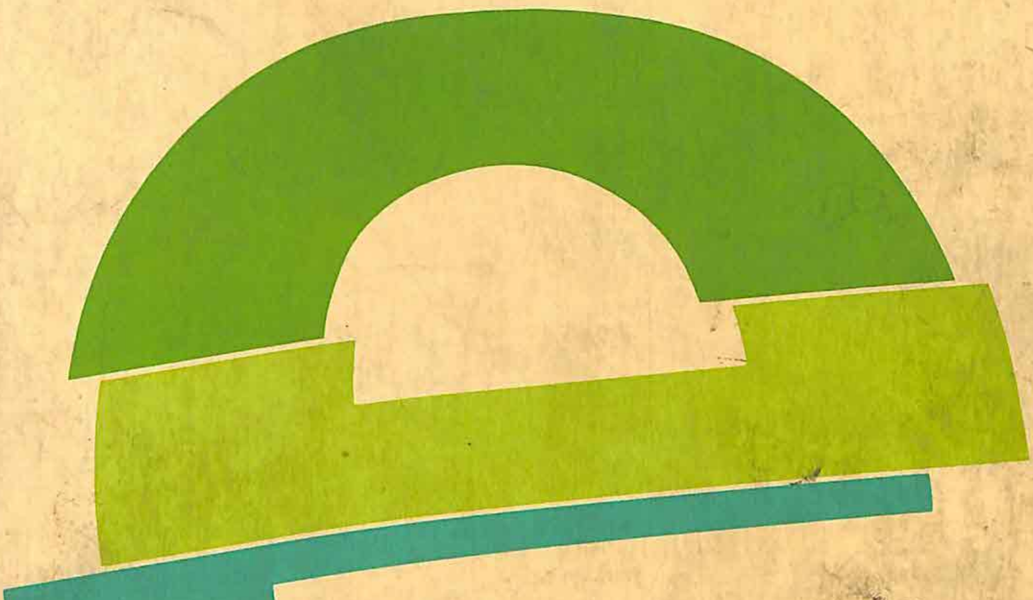
solving educational problems

The theory and reality of innovation in developing countries



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Solving educational problems: the theory and reality of innovation in developing countries

By R.G. Havelock and A.M. Huberman

A study prepared for the

International Bureau of
Education

S.C.E.R.T., West Bengal
Library
Calcutta
25/3, B.C. Road

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S.C.E.R.T., West Bengal
Date 25.4.84
Acc. No. 2918

370.193
UNE

Published by the United Nations Educational,
Scientific and Cultural Organization,
7, place de Fontenoy, 75700 Paris, France.

ISBN 92-3-101527-3

Printed in Switzerland by Journal de Genève.
© Unesco 1977

Preface

Since mid-1974 the International Bureau of Education has been engaged in creating and developing an International Educational Reporting Service. This Service–IERS for short–deals with educational innovation, all deliberate attempts to improve or change the educational process, whether in the formal school system or the nonformal area. The aim is to provide educational leaders, mainly in developing countries (where the need is greatest) with analytical and descriptive accounts of innovations, in the hope that such information will enable them to plan and conduct their own programmes with a better knowledge of the possibilities open to them.

The IBE was able to start the IERS through generous contributions to a special account by a consortium of Agencies[1] interested in supporting educational change and reform in the developing regions of the world. For the most part, IERS activities have focused on a reporting system. As existing materials about innovation are gathered and selected, they have been annotated in an *Awareness list* issued every two months since August 1975. To supplement available knowledge, a number of case studies, inventories and practical guides have been commissioned, for publication in English, French and Spanish in the series 'Experiments and Innovations in Education'. Over 30 titles have appeared so far, drawn mainly but not exclusively from the experience of developing countries. And finally, to draw ideas and news together in a readable form, a bi-monthly newsletter, *Innovation* was begun in June 1975.

The IERS programme is based on a networking approach, which is to say that co-operative action by international, regional and national centres is favoured above centralized operations. In particular, the four Unesco Regional Offices for Education in Africa, the Arab States, Asia and Latin America have developed regional flows of information about educational innovation which are now becoming the major components of a world-wide system of exchanges.

From the outset, however, it was anticipated that a work such as the present one would eventually be necessary, and IERS has moved in this direction through the gradual accrual of its information base. Unlike some of the earlier work in the field, quoted in this book, the case studies here preceded the book as pamphlets rather than being incorporated into it.

This amount of background is necessary to explain and present the study by Ronald Havelock and Michael Huberman. The function of reporting on innovation constantly raises questions about the change process in education as well as value-loaded questions about the quality, durability or transferability of particular initiatives. These problems have given rise to a considerable theoretical literature in which research workers have tried to explain change phenomena in order to help practitioners better to organize for change. However, most of this work relates to industrialized countries, and tends to reach a degree of abstraction or complexity which reduces its applicability in a programme such as the IERS. It was natural, therefore, as an underpinning element for the reporting service, that the IBE should turn to competent specialists and ask them to study the innovation process in developing countries. The present volume is the result.

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[1] Unicef, the aid agencies of Canada, Sweden, the United Kingdom, the United States of America, the International Development Research Centre (Ottawa) and the Ford Foundation.

The two authors need little introduction. They have served as consultants to various United States agencies and internationally to the OECD and Unesco. Both have also been associated with the development of the IERS in the IBE.

Dr. Ronald Havelock, of the Centre for Research on the Utilization of Scientific Knowledge at Ann Arbor, University of Michigan, has established his place as a student of the diffusion process in the social field. Among his most important works are *Planning for innovation through the dissemination and utilization of knowledge* (1969); *Training for change agents: a guide to the design of training programs in education and other fields* (1972); and *The change agents' guide to innovation in education.*

Dr. Michael Huberman is professor and director of the section for educational sciences in the University of Geneva; alongside his experimental work in Geneva itself, he retains an active interest in international education, and an initial study he prepared for the IBE in 1973, *Understanding change in education: an introduction* may, like Dr. Havelock's *Planning for innovation through the dissemination and utilization of knowledge*, be considered a precursor of the present, much further reaching study. More recently, he has centred his work on adult and, in particular, on teacher learning and change. This research is reported in *Some models of adult learning and adult change* (1975).

This study is a reflective outcome of work on educational change in developing countries. It is being disseminated by the IBE and Unesco's Regional Offices for Education in the hope that it may stimulate interest in the *process* of change (not merely the form or content of innovations), so that a more experimental and evaluative approach may emerge in the search for better systems of education.

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CHAPTER ONE

Objectives and overview

FIELD AND FOCUS OF STUDY

This is a study of the *process* of educational change in developing countries. By looking at several different sources of information about educational innovations and by inserting them in a conceptual framework, we try to explain *how* educational change occurs in different settings, *why* it occurs in the ways it does and some of the *implications* for managing change in developing countries.

In order to answer these questions, notably the 'why' of educational change, it is necessary to formulate some theoretical propositions. Masses of information without any organizing principles are useless either in putting that information together or in applying it to practical situations. In this study, the theoretical chapters are meant first to provide a framework for documenting how change takes place, then to interpret this documentation in a way that accounts for the different patterns which emerge. Finally, the theory is designed to predict how future plans for change are likely to turn out. These predictions should allow us to organize better the planning and execution of innovations in various local settings.

We present our theory in a deliberately tentative and preliminary form. The topic is far too broad and complex for all its aspects to be accounted for, at least at this stage of the work. As a result, we concentrate on the usefulness of the theory as a framework for looking at the mass of information we have compiled. There is no rigorous attempt to test and refine the theory against that information. This is another way of saying that *the emphasis in this book is on presenting and analysing the wealth of data collected and on some preliminary ways of drawing practical lessons from them.*

These data come from five sources: first, from the case study literature published within the past five years; next, from a stratified sample of detailed project evaluation reports written by experts or by inspection teams. A third source of information is a questionnaire administered to 81 technical advisers and national directors of teacher education projects in the principal regions of the world. The fourth source is a series of 27 interviews conducted both with a sample of the survey population and with a number of experienced administrators, experts and national officials. The final source of information is the recent theoretical literature of educational change.

These sources of information are presented in such a way as to interrelate what they say about the nature of different types of educational innovations in different settings. They are also seen in relation to our emerging theoretical explanation of how and why changes take place. Our interpretations draw heavily on the conceptual and methodological principles of a broadly conceived 'system theory'; and we have attempted to make those principles both accessible and readable to the non-specialist without over-simplifying them. In particular, we build on two sub-fields of systems theory: theories of information (cybernetics) and theories of development (notably the theory of genetic epistemology formulated by J. Piaget and the Geneva

School). These concepts are then applied to the process of change seen both as a *chronological sequence* (origin, plan-implementation-adoption or rejection) and as a more strategic cycle of *solving problems in social situations.* One of the merits of this approach is that it transcends the false polarity of 'developing' and 'developed' education systems, while taking account of the meaningful differences between various countries and various forms of in-school and out-of-school education.

METHODOLOGY AND SOURCES

The five sources of documentation for this study are enumerated above. Apart from the final source, the theoretical literature on change, it is worth elaborating on the other sources and on the way in which informmation from each was sought and organized.

Case study literature

Surprisingly, this was the most disappointing source of information, less in absolute terms than in relation to our expectations. We conducted an intensive search in three languages for books, journal and newspaper articles and films which would shed light on recent innovations in developing countries. In doing this, we were able to draw on a considerable quantity of documentation at the International Bureau of Education and at Unesco headquarters, as well as on the network of regional centres. We were interested in the following type of documentation:

- studies which, in general, focused less on the content of an innovation than on the process of its origins and implementation;
- studies both of locally initiated innovations and of nationally initiated projects;
- innovations which received external assistance, as well as those which did not;
- case studies including a detailed account of the sequence of events and the configuration of events during the life of an innovation;
- studies written by on-the-spot observers, rather than *a posteriori* accounts on the part of external researchers.

These criteria proved hard to meet. Most reports were found to deal with the content of change (rural vocational training, use of instructional media, functional literacy, curriculum reform at the primary or secondary school levels, teacher education, etc.) and very few with the process. There were few accounts of locally initiated innovations; most studies reported either on large-scale projects or on innovations assisted by some form of external expertise and finance. There were no recent ethnological studies, and even fewer after-the-fact analyses than anticipated. This situation obliged us both to draw heavily on the few in-depth studies available (1) and to rely on the interviews, project evaluation reports and questionnaire responses for the greater part of our 'process' information.

Project evaluation reports

This proved to be a rich and untapped source of information. These reports are in-depth evaluations of projects which have been assisted with expertise, facilities and materials or equipment by bilateral and international agencies. The evaluations are conducted by teams of experts who have aided the projects, by teams of outside evaluators or by programme specialists of the various executing agencies and foundations. The reports often contain a good deal of information about the process of change in each case. Obviously, names and places of projects have been kept anonymous.

A sample of 19 projects of varying types was selected for content analysis. These projects varied greatly in region, duration, form of assistance and level (e.g., in-school and out-of-school; child-centred, youth-centred and adult-centred). From this sample, and independently of the content analysis, eleven projects were further analysed, rated and coded on the section of the questionnaire relating to 'problems' or 'barriers' encountered in the course of implementation (see Annex). As well as constituting an additional source of information on problem areas, they served as partial measures of reliability for the survey data.

Survey

Neither our resources nor time constraints allowed us to go into the field to collect comparative data on the many different kinds of projects which were relevant to this study. Nevertheless, we were eager to seek any opportunity to collect data on a number of process issues from a reasonably large sample of projects. This opportunity arose in September 1975, when Unesco convened a week-long conference of Chief Technical Advisers and National Directors of Unesco-UNDP supported teacher training projects. Projects were from developing countries in all parts of the world (52 per cent Africa, 20 per cent Asia, 19 per cent Latin America), represented a considerable range in size and duration (from 100 to over 50,000 trainees, from less than US$ 100,000 to more than $ 1,000,000 per year in UNDP support), and covering a variety of approaches from non-formal projects to institution building and reform to system reform to curriculum materials production and development. Most of these projects were innovative to some degree and most represented significant efforts to upgrade teacher training in the countries concerned. The CTAs and Directors were all experienced people in very responsible positions from which they could have observed and contemplated most of the process issues with which we were concerned. Most of them, we surmised, would have experienced many of the 'barriers' which are likely to occur at one time or another in projects and many would have tried out a number of the strategies of managing innovation which we had identified in the literature. In short, this appeared to be a rather good group to appeal to for a great deal of information about the process of innovation.

A questionnaire of 243 items (see Annex) was prepared in the three working languages of the conference (English, French, and Spanish) and was administered at a late morning plenary session on the second day, when nearly all participants were in attendance. Approximately 90 per cent of those in the session filled out the questionnaire: the remainder appeared to be either observers or Unesco Headquarters staff who deemed themselves inappropriate respondents. Most respondents completed their forms within one and a half hours, and 81 usable questionnaires were returned, 42 from CTAs and 39 from National Directors. Although CTAs and Directors came to the conference as two-person teams they filled in their forms independently and without consultation. Since all forms were administered anonymously, there was no opportunity to match and compare responses on a project-by-project basis. Nevertheless, subsequent analysis revealed very few significant differences in the response of the two groups.

The results of these 81 responses to 243 items were subjected to the most intense analysis over a period of several months. Many thousand interrelationships were examined using various techniques from simple 2 X 2 contingency tables to multiple factor analyses, rotations, and plottings. For the most fine-grained analyses, where the numbers were usually very small we relied mostly on non-parametric statistics, especially the chi square (X^2), and to indicate the degree of association between variables, the 'coefficient of concordance' (C). These are conservative measures which are likely to underestimate real effects. On the other hand, when we were working with the entire data set and attempting to make more complex analyses, we resorted to parametric measures, in particular to the Pearson product-moment correlation (r) which may tend to overestimate true relationships by a slight amount. Finally, to analyse very large sets of items we resorted to the clustering technique known as 'principal components factor analysis'. While recognizing that our data do not meet many of the assumptions required for some of these elaborate statistical procedures, we justify their use on the grounds that our purpose is not affirming reality in certain terms but rather the exploration and discovery of possibilities. In many cases these various statistics helped us to think through a number of alternative explanations which would not have occurred to us otherwise. We feel that this very flexible and tentative use of statistics is highly justified and desirable when working in a field such as innovation where the data base is thin and the terms of reference only emerging.

The questionnaire. The focus of the questionnaire was the specific project on which the respondent was currently working. Within this context we asked for responses to four major sets of questions. The first was purely descriptive data about the project including: duration, number of trainees, type of activity, and level of support both from UNDP and the country itself (all were jointly funded to a degree). The second major set of questions asked for descriptions of the main stages of the project: origins, establishing and publicizing the need, setting objectives, then moving on to planning, acquiring resources, developing participation, implementation, evaluation and finally outcomes. Almost all these items were put in closed-ended fashion so that only a simple check among alternatives was necessary. This procedure was adopted both to save time and to ease the process of transforming the responses for computer analysis; its use was justified, however, for two reasons: first, our considerable background reading of case materials gave us a good idea of the kind of alternatives which would be most likely; secondly, as mentioned below, the questionnaires were followed up by extended interviews with selected members of the sample. These interviews covered many of the same topics but allowed the respondent to make a free and full narrative of the course of a project as it had unfolded in his experience.

In a third set of more than 70 items we attempted to gather within broad topic areas what appeared to be the most frequently listed problems, difficulties, or 'barriers' encountered in the implementation of innovation projects. This list is unusually broad in its scope, covering historical, political, economic, procedural, social, psychological, and geographic factors, and one special chapter of this volume has been set aside for their analysis.

The fourth and final set of items presents six clusters of five items, each representing a different perspective or 'strategic model' of the innovation process as a whole. Most of these items derived from previous items used by Havelock in the United States. The international data reveal some interesting similarities and differences which will be reported in the chapter IX.

Interviews

This source provided the richest and possibly the most significant information. Well-conducted interviews typically yield more information than questionnaires, and they can also be better shielded from response bias. Our sample of 27 interviewees came in roughly equal numbers from the following populations:

(a) Experts and technical advisers. The sample included people with 10-20 years of experience with dozens of different projects in various regions of the world. These people have very often evolved their *own* theories of how change in education takes place—theories based on a depth of personal experiences with many cases. Even though these theories are neither written down nor formalized, they deserve to be taken seriously together with those which are.

(b) National project directors, ministry officials and heads of teacher education institutions in developing countries. These are people with in-depth knowledge of the settings in which innovations occur. They are in many cases the originators as well as the executors of the project. Again, they have years of experience and varied ways of formalizing it that shed light on the change process.

(c) Programme officers in bilateral and, in particular, in international agencies (Unesco, UNDP, ILO, WHO, FAO, etc.). Interviews were centred on officers from developing countries and on specialists connected with projects in our sample of evaluation reports. Having administered many projects and served as advisers for several, these officers had both a detailed knowledge of individual cases and an understanding of the different patterns which characterized projects having similar case histories.

The interviews were administered by means of a fairly elaborate interview schedule containing both closed-ended and open-ended questions. The primary objective was to go over in detail the projects which formed the basis for the questionnaires and evaluation reports, but we were also interested in previous projects, in other personal experiences and in the person's own ideas about innovations in developing countries.

STRUCTURE OF THE TEXT

Although the book is divided into ten chapters, it may be more accurate to think of it in terms of four major parts as follows:

1. Theoretical foundation (Chapter II)
2. Theory *vs.* reality: an overview (Chapter III)
3. Stages in the life of a project:
    (a) Starting (Chapter IV)
    (b) Planning (Chapter V)
    (c) Acquiring resources (Chapter VI)
    (d) Participation (Chapter VII)
    (e) Finishing (Chapter X)
4. Gross analysis of process elements
    (a) Barriers (Chapter VIII)
    (b) Strategies (Chapter IX)

A brief rationale for each of these sections follows.

1. We are most concerned that this be a practical book, and as much as possible a factual book, but we firmly believe that these aims are aided, not thwarted, by good theory. The theory put forward here is a simple one; it contains no technical formulae, no mathematics, and very few long words. It starts from scratch with very elementary notions of what human and social organisms are like and it builds from these systematically toward the much more complicated ideas of innovation, educational change and national development. The hasty reader may be tempted to pass by this section to get to the specifics which follow, but in so doing he should be aware that he is by-passing the whole to examine the parts. In Chapter II we try to get to the heart of such questions as *why* people innovate and where innovation is taking us, as individuals and cultures.

2. The second part of the text, contained in Chapter III, tries to form a bridge between our theory and the impressions we derive from an analysis of specific cases. The theory is boiled down to three gross dimensions (infrastructures, authority, and consensus), in the light of which four project patterns are discernible, the 'alternative of grandeur', 'controlled expansion', 'crusade', and 'small scale-local'.

3. The third part of the text attempts an analysis of the major aspects of an innovation project from an imaginary beginning point to an imaginary end point. It is in these sections that we try to bring about a convergence of our various data sources and it is from these sections that the practising innovator or consultant may derive the most practical and specific implications.

4. The fourth part of the text attempts primarily to make sense out of the two largest data blocks in the survey. Information about both barriers and strategies is scattered throughout the other chapters, but here each is treated as a whole. Both the 'barrier' analysis and the 'strategy' analysis provide alternative ways of looking at the process of innovation to that provided by the chronological stage model of the other chapters.

THE THEORY

Our theory starts with the idea that people and groups are always aspiring to 'complete' themselves or to 'develop' into something greater or better than what they are now. If we traced their pattern of energy output and activity over time as they are engaged in this aspiring, we would find that it goes in spurts or cycles, periods of rapid growth followed by periods of integration and consolidation.

The theory also proposes that there is a growth sequence for all systems which begins at the lowest level with 'relation', i.e. being together in the same space, and proceeds toward 'connexion', 'cohesion', 'dynamic connexion' and, finally 'dynamic cohesion'. When various smaller systems join to form a larger whole, as may happen when new nations are born, this whole process begins anew. The major thrust of the innovation process is to move systems toward higher levels of connexion and cohesion.

In order to develop and complete themselves, systems must continually borrow or acquire elements from the environment; this receiving process is called 'input'. Major inputs may come either from the proximate environment (local) (inside) or from the remote environment (foreign) (outside). Developed systems have elaborate mechanisms for managing inputs from both proximate and remote environments; these include processes for searching, analysing, evaluating, decomposing, recomposing, adapting, etc. Developed social systems usually have specialists and specialized agencies to help manage inputs. It is also most important to recognize that successful input management requires two-way dialogue with other systems which may be resource providers.

The essential internal process by which the system struggles toward completion can be called the 'throughput'. Throughput is accomplished by a *flow* of ideas, knowledge, products, and service among the various people and groups who make up the system. The way in which this flow takes place is the key to the difference between more successful and less successful systems. We use the term 'procedural configuration' as the general term for this internal pattern of flow. The adequacy of the throughput also depends upon the effectiveness of the system's leadership and the extent to which all members feel they participate and are rewarded by what the system does.

Finally, the effects and the effectiveness of a system are measured by its 'outputs'. What has been said for inputs applies generally to outputs also. Crucial 'proximate' outputs are the rewards that a system provides for its members. 'Remote' outputs constitute exports which may either deplete the system or constitute surplus which can be exchanged for vital inputs. Effective output no less than effective input requires two-way communication with other systems.

Major aspects of this theory repeat themselves and are elaborated in different parts of the text. For example, the chapter on resource acquisition constitutes a more thorough exposition on the question of input processing in addition to providing evidence from our survey and other sources. Similarly, the chapter on participation reinvokes many of the same concepts already introduced under the heading of 'throughput'. The final chapter, on 'finishing', brings back many of the concepts related to output processing.

HIGHLIGHTS FROM THE PRINCIPAL CONCLUSIONS

Patterns and realities of educational innovations

Many of the educational innovations in developing countries involve a 'major system transformation'. They are typically ambitious both in the amount of time, energy and material resources invested and in the degree of rapid and massive changes expected. In spite of such large-scale investments and expectations, few of these innovations appear to make a major dent at the *national* level in the educational or training problem which they were designed to solve. They appear in many respects to be giant pilot projects.

In these innovations there is generally a very rapid movement through the problem-solving cycle, from the initial assessment of the need for change to the design of a solution and the implementation of that solution. Implementation is rapid and widespread, and it is effected through existing administrative machinery rather than through informal or indirect channels. There is typically no trial or experimental phase preceding full-scale execution, which can be accounted for by the perceived urgency of the needs, but which often increases the number and seriousness of the problems encountered during and after implementation.

Those who appear as key actors at the origin of the solution or of the initial design of the innovation are of two types: (a) external advisers seconded to the ministry or provincial education offices and (b) such well-placed 'insiders' as planning or ministry officials who travel frequently outside the country, heads of university education departments and close personal advisers to educational or political leaders. It is very difficult to channel solutions from 'below' into the councils where innovations are designed.

Given the ambition of the project in relation to the country's own resources and, in particular, to its capacity to process a great number and variety of information and decisions concerning ongoing and new programmes, these innovations run into many unexpected problems and often have unexpected outcomes which take them far from their original objectives.

There is a wealth of smaller, locally initiated innovations which are not often communicated outside the local setting. These projects often constitute a response to immediate and urgent problems facing the community, and they are possibly the *only* innovations over which there can be sufficient consensus to ensure rapid implementation and durable adoption. The problem-solving cycle is slower and centres chiefly on the choice of an acceptable and practical solution which can show some initial benefit very promptly. The innovator often corresponds to the classic profile of the 'cosmopolite', and the innovation moves far more quickly if this person has connexions to provincial officials. These projects are typically plagued by a near-absence of necessary resources and little prospect of finding more; this circumstance makes the initial phase of implementation more critical in determining the outcome of the innovation. Indirect, informal, socially-interactive techniques of installing and spreading the innovation are predominant. Some of the more successful, more visible but less controversial local innovations are picked up by provincial or national officials and tried out elsewhere, sometimes on a far more expensive scale.

Four very approximate project patterns can be delineated: 'the alternative of grandeur', 'controlled expansion', 'the crusade' and 'local change'. The last two appear to have a higher rate of successful and durable adoption.

Inputs

We divided our analysis of inputs into two subsections, one dealing with financial inputs and the other dealing with technical knowledge. It was impossible to answer the question, 'Did higher levels of funding make the project better?' but it appeared that higher levels of funding from *inside* the country were associated with a more sophisticated knowledge acquisition strategy, more varied use of media and a judgement by the respondents that the goals of the project were more realistic. Level of UNDP funding, on the other hand, did not appear to be significantly related to any other important process variables. Respondents to the survey expressed only mild dissatisfaction with the level of funding either from inside or outside. A cluster of variables constitutes what could be called the 'economic troubles' syndrome but, curiously, this cluster was not in the least correlated with the actual level of funding either from inside or outside.

Turning to the patterns of technical knowledge utilization, we found few dramatic contrasts between inside and outside users; in fact all types of technical knowledge use tended to be intercorrelated and high use of outside resources was quite highly correlated (r = .35) with high use of inside resources. (The most interesting pattern which emerged from these analyses was what we called 'sophisticated resource utilization' (Table 6.6), in which great reliance is placed on a combination of books about development, documents and site visits to projects inside and outside the country and consultation with outside experts. This pattern was related to coherent planning, emphasis on evaluation, use of various types of media *and* a higher level of *national* financial support)

Participation, leadership, and media use

From countless studies and interviews comes the consistent theme that innovations must receive support from leaders in order to survive. If the project is national in scope there must be leadership support at the highest level, preferably the president or prime minister. This support must be more than formal or legal: it must be active. The leaders must show interest by appearing in public to advocate the innovation, by attending demonstrations and visiting classrooms, and particularly by using their great influence with the media to make sure that the message is spread to all citizens.

Yet leader participation is not in itself sufficient; ideally there should also be very active participation from below, i.e. from teachers and students and from the community. The survey data indicate that there were very few efforts to gain student participation and that teachers tended to be involved only on the lowest and most routine levels of decision-making, if at all. On the other hand, over 95 per cent of respondents indicated that there was some form of involvement by the community, usually at the level of working teams, but sometimes at all levels. This finding highlights the importance of media use as an attempt to (a) make the community aware of educational needs, (b) make the community aware of educational innovations relevant to those needs, (c) arouse their interest in these matters and (d) give them a vicarious sense of participation in the problem-solving and decision-making process.

Barriers

Given the disequilibrium between the objectives of many projects and the capacity of the educational and administrative systems to service so many and such various components, a great number of logistical problems are encountered. These barriers are associated with difficulties of communication, co-ordination, and decision-making among various people connected with the project. There is a resulting lack of clarity in the structure for making decisions within the project, a lack of common understanding of the project's objectives and delays in authoritations and deliveries of needed materials. These problems are worsened by a high rate of turnover of key persons associated with the project.

Another series of barriers is due to a lack of human or material resources (trainees, trained personnel, funds, equipment), but much of this may be attributed at least partially to optimistic and therefore unrealistic planning. The problem of inadequate consideration to problems of implementation is frequently encountered in all sources of data, as are underestimation of costs, insufficient quality of materials and delays in the preparation of needed materials for which the schedule has been too ambitious. Problems of long distance between places and slow transport of materials may also result in part from unrealistic planning. Innovation can also be frustrated or distorted by a vestigial colonial education system, which is now grossly inappropriate to the needs of the country; innovators may underestimate the institutional barriers in their initial eagerness to introduce changes which are long overdue.

There are indications that some of the advantages of external assistance are offset by problems of social relations and differences of cultural values between members of a team comprising nationals and internationals. Some of the data suggest that the most effective advisers are more likely to be diplomats and enlightened pedagogues than to be highly skilled and competent technicians.

The pattern of problems in locally initiated and small-scale innovations is somewhat different. Such innovations are characterized by lack of resources, resistance to new ideas of practices on the part of many people affected by the change, lack of administrative support, isolation and poor quality of materials.

Strategies

The survey included 30 items expressing various points which might be included in an optimum innovation strategy. Respondents were asked to indicate how far their projects exemplified these approaches. The results of our analysis tend to confirm previous research regarding innovation strategies and ideologies. The responses fell into four clear and distinct clusters which we labelled 'Participative self-help', 'Diffusion', 'Power', and 'Open input'.

The strongest cluster, *'Participative self-help'* included items such as emphasis on 'local control over decision-making', 'responsiveness to local customs, needs, and desires', 'wide latitude for individual initiative and choice at the local level', 'self-help', and 'the belief that people ought to be able to solve their own problems with minimum outside assistance'. This cluster was also associated with relatively high national financial contribution, project origination and objective setting by people inside the country, and the early replacement of both outside personnel and outside financing. On the other hand, projects which followed this strategy also claimed higher use of sophisticated external resources. They also use various media extensively and report fewer social barriers to implementation.

Closely associated but distinct from the above was the strategy of *'open input'* which included such items as: 'broad definition of goals', 'openness to recycling, redefining goals and procedures', 'maximum use of all resources, national, local and outside', and 'search for new ideas from as many people as possible'. This 'open input' strategy was also related to high national financial contribution, use of media, especially large group meetings, speeches and radio, and to an inside origin to the project. There was also a high correlation between the self—help and open input strategies and both tended to be highly endorsed by our respondents.

Another very distinct strategy, which we called *'power'*, involved 'clear administrative hierarchy for decision-making', 'use of directives, laws, rules and procedural manuals', 'negative sanctions for failure to conform to project procedures or to meet project objectives', and 'involvement and direction by top political leadership'. This strategy was clearly much less popular than the two already mentioned but just as clearly represents an approach which is still widely used. It is also associated with the use of media such as speeches and radio and it is slightly (r = .20) related to the level of UNDP funding.

A fourth distinct approach, which we labelled *'diffusion'*, included items such as 'use of informal channels', 'techniques of persuasion', 'identification and use of formal and informal leaders of opinion' and 'the planned use of mass media to create awareness of the innovation'. The items in this cluster were written to correspond to the main findings of the sociological studies of the diffusion of innovations (e.g. as summarized by Rogers and Shoemaker (3). This strategy is also correlated with high national contribution and early replacement of non-indigenous personnel and funding. It also correlates with our index of participation by various groups and levels of the education system, the use of relatively sophisticated resources and the employment of various media. Most respondents, however, did not report very extensive use of this strategy in spite of its firm foundation in sociological research studies.

The above findings regarding strategic clusters correspond quite well to findings reported in other studies and to the theoretical summaries reported previously by Havelock (4), Huberman (5) and Dalin (6). We failed, however, to find clear reaffirmation of a strategy which we would call 'rational-empirical' or 'research-and-development', and which we had predicted from these previous works. Apparently research-based and very systematically planned, implemented, and evaluated projects are quite rare in developing countries in spite of their popularity in some developed countries, notably the United States and Sweden.

Finally, in this study we introduced the concept of two-way dialogue as a separate strategic alternative, predicting that a cluster would emerge out of such items as 'joint funding by nationals and outside agencies', 'joint planning by inside and outside experts', 'two-way dialogue between the project and others', and an emphasis on 'feedback'. All these items were highly endorsed by our respondents but they failed to emerge clearly as a statistical cluster in our analysis. Perhaps the most promising finding was that the single item 'two-way dialogue' was correlated significantly with a *low* number of reported barriers to innovation over-all. Considerable emphasis is placed upon the importance of two way linkage in various parts of this book. We expect that it may emerge in the next few years as one of the most popular ways to view the work of international agencies in encouraging national development, in education and other fields.

Outcomes

In the short term, many many innovations run into unexpected difficulties which can be attributed at least partly to planning which is too rapid or too superficial. Considerable time, energy and resources are used up in coping with these difficulties, so that the innovation is often delayed or diverted. In few cases is the short-term outcome consonant with the short-term objectives. Often, the number and variety of unanticipated outcomes obliges officials or project directors to cut the scale and scope of the innovation to more modest proportions. This action tends to make implementation and adoption smoother, but it also diminishes the margin of change initially sought and probably still needed to meet the needs of the community, institution or province.

At the same time, the long-term effects are often less than those originally aimed at.

This is due principally to three factors: the too great distance between the desire for change and the existing skills or behaviours of the learners or institutions, the inadequate attention given to practising and mastering these skills or behaviours during the life of the project; and the force of the larger environment in reducing the changes to more familiar and 'digestible' proportions.

The precise nature and degree of these outcomes is difficult to asses in the light of the low levels of detail, rigour and reliability in the formal evaluations which are made. In particular, follow-up studies seldom exist. In relation to the specific objective of transferring responsibility from external to indigenous personnel and finances, the rates of success appear to be higher for smaller, well-planned and locally (as opposed to externally) originated innovations. Some of the conditions associated with good transfer of responsibility are (a) provision for support during the adoption phase, (b) gradual increase of practice and responsibility during the life of the project and (c) development of self-confidence and commitment to the innovation through a demystification of the 'expert-specialist' role.

There is little precise or reliable information as to how and how well many of these very large pilot projects are generalized or diffused to other publics. Data available suggest that there is a tendency to generalize rapidly, with little prior planning or negotiation, and to push such diffusion through the existing administrative channels. This strategy can often signal many unexpected difficulties to come, notably increased resistance to the desired changes and subversion of the initial goals. Due to the perceived urgency of the needs and to the impatience to provide at least temporary solutions, some of the slower, less direct techniques for disseminating innovations are seldom used, although they show promise of bringing about more durable and more widespread change in the longer run.

IMPLICATIONS

In many ways this was a challenging book to write but it was also frustrating from two points of view. First of all, it was frustrating because the case study literature and the empirical research which we expected to find in rich abundance were not really there, and were especially lacking when we began to place the framents we had into our grid of major process elements, steps, strategies, barriers, and so forth. In other words, we came to realize that the research literature in the field of educational innovation was woefully lacking in most respects. For this reason, the process of innovation management must still be considered very much an art and not a science; indeed, it is a crude art form at best! No one can be blamed for this; first, we had to try and to commit our errors before we realized that we needed to know more about *how* to innovate in addition to knowing *what* to innovate. Furthermore, as can be demonstrated from the many hundred of conceptualizations, descriptive formulae, and taxonomies of elements which appear in the next nine chapters, the subject of innovation process is extremely complex: there appear to be innumerable possible barriers, potentially sound strategies, and countless steps from origin to ending. Hence a science of innovation process would be no simple matter to construct.

The second frustration emerged from reports and comments about the outcomes of innovations and the processes which were engaged in, especially as the pattern emerged from unpublished reports and the extended reflexions of experienced international consultants. Our conclusion was that innovation is not practised up to the level of existing knowledge. Our findings paint a rather dismal picture of international and national efforts to innovate, repetitions of obvious mistakes or omissions. In other words, the practice of innovating needs drastic improvement and we believe that this improvement should begin with a reappraisal by the international organizations of the true fruits of their labours over the last few years. The international network of experts which plays such an important role in advising developing countries concerning educational innovations should be made much more clearly aware of the knowledge already available of the process of innovation, and they should rethink their approaches in these terms. This book is not intended just for the international network, however, for what applies at the international level applies to an even greater degree within countries.

(From these twin frustrations we derive two sets of implications, one for the improvement of knowledge in this area, and the other for the improvement of existing practice)

For improving knowledge of the process

First of all, there is a need for new and far more ambitious efforts than we have had to date to generate case studies of innovation which are useful both for the researcher and for the practitioner. Such a new series of case studies should include at least the following five features. (a) They should cover a specific situation within a particular country in *depth*, using interview techniques and direct observations at the national, regional, and local levels and retrieving information not only from officials but also from students, teachers and other community members wherever feasible. (b) They must be *objective*, reporting on failure as well as success without assuming one or the other in advance of the data collection itself. This means that they cannot be conducted by those who were directly involved and perhaps not even by those who might have a personal stake as colleagues or associates of those who were involved. (c) These studies must focus on the *process*, not simply on the content of the innovation: they must look at the various stages, examine the strategies employed, and identify the barriers encountered and find out how they were overcome. (d) Fourthly, these studies should make use of our existing attempts to categorize innovation process, following some kind of *uniform grid* to collect many of the pertinent facts so that *post hoc* comparisons, summations, generalizations and syntheses can be made possible. (e) Finally, such studies should be conducted so that the innovation can be *traced over the years* of its implementation, diffusion, expansion, or demise. The sad fact is that innovations look very different in the first enthusiasm of their promotion and in the later years of their implementation.

In addition to case studies, there is probably also a need for a few experimental projects in which alternative strategies of innovation are deliberately tested and compared under equivalent conditions. Beyond this, there is certainly a need for more efforts at synthesis of case studies and analyses of particular process issues such as those addressed in the various chapters of this book (e.g. analytical studies exploring the problems of resource acquisition or participation).

Above all, there needs to be a serious investment by the international agencies and the foundations in research on the process of innovation.

For improving the practice of practising innovators

We believe that there is no reason to wait for many more years or study before the lessons of this book are applied. There are at least three avenues which should be pursued without delay. First, there are many kinds of print materials other than this book which need to be prepared and disseminated widely; second, there is a need for new types of training programmes; and, third, more broadly, there is the need for the development of specialized linkage mechanisms.

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Print materials relevant to the process. There is a need for at least two kinds of print materials. One could be called process guides – practical manuals which tell the how of important aspects or steps of the innovation process were put into effect. These might focus, for example, on such issues as how to maximize participation in an innovation, how to acquire resources, how to create and use various kinds of print materials. The IBE, under the IERS programme, has already published a manual on how to conduct radio study group campaigns (7). In some ways, this might be a prototype of the kind of practical document referred to here. Another type of document which is needed is the handbook or catalogue which covers the many alternatives available within a particular category of innovation such as reading or elementary science. Such a catalogue should systematically review the existing case study literature for this particular innovation on a world-wide basis and should note the special conditions and problems associated with an innovation in a given type of environment. It should not simply make an uncritical listing but should provide substantial advice to the potential innovator, pointing to limitations of the information sources drawn upon. Such a handbook should also endeavour to inform the reader about possible ways of adapting an innovation for variations in setting, resources, and purpose.

Training. It is a fact that the international agencies already expend considerable amounts of their funds to train, brief and generally support and subsidize an international community of 'experts' on this or that aspect of educational innovation. In the course of our investigations we have had an opportunity to engage in extended discussions with many of these experts and we have no reason whatever to challenge either their sincerity, their effort on behalf of the developing world, or their wisdom as regards their respective fields. It became obvious, however, from our interviews, that many members of the network and their national counterparts are not well informed about the existing knowledge of the process and the management of innovation projects. It would therefore appear to be timely to begin infusing this knowledge into existing training programmes, seminars, and conferences, and to establish special training events for the same purpose. Through such mechanisms as the Unesco Regional Offices, training in innovation process should also be provided for key innovators and administrators in developing countries, and national programmes of an equivalent nature should also be undertaken.

Linkage mechanisms. Finally, there should be more effective and more adequately supported insitutions, media, associations, and informal networks to connect innovators (a) with each other, (b) with the world information base in their respective fields, and (c) with the sources of expertise on the process of innovation. It is not one but many kinds of activity which need support. First of all, there is a need for national and regional clearinghouses containing not only the world literature but also the names and information on the availability of experts and practitioners engaged in similar enterprises. There should also be newsletters, bulletins, and information services to supply a constant flow of information to actual and potential innovators, not just on the ministerial level but at the level of the local district as well. Ultimately, it may also be necessary to develop a new breed of international specialist who might be called the innovation *process* expert or the innovation linking agent. Such roles may emerge as part of an alternative approach to international co-operation for development, an approach which pays less attention to the substantive expertise of the so-called developed countries and focuses more fully on improving strategies and capacities for problem-solving, building consensus and generating resources within the developing countries themselves.

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Notes and references

1. Four studies proved to be especially useful:
   - the analyses by R. Lallez of both the IPAR project in Cameroon: *An experiment in the ruralization of education: IPAR and the Cameroonian reform*, Paris, 1974. (Experiments and innovation in education no. 8) and the CER project in Upper Volta: *Innovation in Upper Volta: rural education and primary schooling*, Paris, 1976. (Experiments and innovations in education no. 21);
   - the ICED case studies of out-of-school education and training: Coombs, P. and Ahmed, M. *Education for rural development*, New York, Praeger, 1975;
   - the anthology of P. Ponsioen on African education: Ponsioen, P., ed., *Educational innovation in Africa*, The Hague, Institute of Social Studies, 1974; and
   - the Unesco evaluation of its Experimental World Literacy Programme, compiled by A. Gillette and S. Spaulding: Unesco, *The Experimental World Literacy Programme: a critical assessment*, Paris, 1975.

2. Much help was provided in this task by Professor David Handley of the Political Science Department of the University of Geneva.

3. Rogers, E. and Shoemaker, F. *Communication of innovations: a cross-cultural approach*. New York, Free Press, 1971.

4. Havelock, R. *Planning for innovation*. Ann Arbor, CRUSK, 1969.

5. Huberman, A.M. *Understanding change in education: an introduction*. Paris, Unesco, 1973. (Experiments and innovations in education no. 4)

6. OECD. *Case studies of educational innovation*. Vol. IV: Dalin, P. *Strategies for innovation in education*. Paris, CERI, 1973, 330 p.

7. Grenholm, L.H. *Radio study group campaigns in the United Republic of Tanzania*. Paris, Unesco, 1975. (Experiments and innovations in education no. 15).

CHAPTER TWO

Social systems and innovation systems: a unified framework for understanding the process of deliberate change

A VIABLE SOCIAL SYSTEM IS A MIRACLE: INNOVATORS BE HUMBLE!

The wisest experts on change process warn us to respect the existing scheme of things, especially if it works and seems to be serving the psychological, social and material needs of its members at some level of satisfaction. There are at least two reasons for such caution: (a) the system may not need you as much as you thought and (b) you might do more harm than good by weakening or destroying delicate social institutions which were functional in ways you never guessed. The fabric of a society is intricately complex; it has been built up over many generations (actually countless thousands in almost all cases); and most of its features came there for a reason. Therefore, would-be innovators, if they mean well, first need to know what these features, customs, habits, values and institutions are; secondly, they need to know or estimate how they might be affected by the proposed innovation; thirdly, they need to know *why* they came into being and what functions they served then and now; and, finally, they need to consider, after all this, whether the innovation will do more good than harm. Such a cautious anthropological approach has been suggested increasingly in recent years by observers of international innovation projects. Axinn and Kieffer (1), for example, contrast the 'technical assistance institution building' approach to the 'exploration and discovery' approach which they favour. The latter 'assumes that fundamental functions are carried out in all social systems. Each nation has some kind of existing system of these functions. The first steps (in an intervention strategy), therefore, are to explore the (others') situation and discover the means which are used to carry out the functions.' A somewhat similar view is expressed by the British economist E.F. Schumacher in his popular *Small is beautiful* book on technical assistance in the developing world (2). Any discussion of the implication of such views for strategy is reserved for later; the views are cited here only to illustrate the fact that *existing* social systems have an intricate complexity which is related to their historical and contemporary function. All too often we ignore this history and functionality; it is too easy to take such things for granted as givens to which we pay lip service but, too often, innovators then proceed to act as if this rich and complex socio-cultural context did not exist.

The time is now past for innovators to behave in such ways. They must begin to think in a much more sophisticated way about what social systems really are, both the smaller innovation systems which they are forming and the larger and much larger systems which they are attempting to penetrate and change. There are by this time many thousands of studies and reports on this or that innovation project. Collectively, we are sure that they contain the required wisdom to educate and inform a new and more effective type of innovator. We have read and tried to absorb some of this material in preparing the present work; but the material does *not* speak clearly for itself. It is massive, confusing, and sometime apparently contradictory. We strongly believe, therefore, that a book of this kind would have little meaning if it did not provide its readers with some ways of making sense out of confusion. Our way is through the explanation and then the application of a theory of systems. A theory is not essential for understanding many of the specific issues involved in innovation process, but without a theory there is no framework for understanding and making sense out of such diverse events, facts and figures. We shall try to present this theory in a way which is simple and logical. A good theory is not just for scholars, philosophers and scientists; it is also for practical decision-makers because (a) it separates experiences and findings; (b) it gives a basis for predicting what is likely to happen in a particular innovation project in a given country by pointing out the areas of similarity to other projects which have been tried in the past in similar settings. Finally, (c) a good theory should provide suggestions and recommendations for project directors and project implementers. In short, we believe, with Kurt Lewin, that there is nothing so practical as a good theory and in the pages which follow we shall try to demonstrate why this is so.

The chapter is divided into nine sections. The first provides the general theory. We start with some simple definitions and examples of what is meant by 'system', 'change', and 'innovation', and follow this up with some clarification which should make the application to innovations in developing countries clear. Thirdly, we consider the crucial question of how new systems come into being; how is it possible? what are the problems and pitfalls? Fourthly, we consider how systems grow from their beginnings and how they transform themselves. We shall try to analyse 'development' and 'developing' in a way that makes sense both as these terms are used popularly and as they may be related to a theory of system change. A fifth section is concerned with system input processes. It asks how new ideas, information, resources and people are acquired, introduced, and utilized by the system. The sixth section looks at how systems function internally. It asks how the various components of a system are related to one another and to what end. What are the procedural configurations? What types of problem solving take place? The seventh section considers system output, the impact on the environment and on larger and smaller systems to which this sytem is connected or of which it is a part. The evaluation and interpretation of outputs and their use for system redirection and self renewal are also considered here. In the last two sections we shift from the descriptive to the prescriptive, tentatively offering models of what the optimal system and the optimal innovation project might look like.

SYSTEM, CHANGE, AND INNOVATION: SOME BASIC DEFINITIONS

What is a system?

Fundamentally, a system is a set of elements which are related to one another in some significant way, usually in many ways. It may not serve our purpose here to go too far into the philosophical realm to explain the term 'system'. Suffice it to say, however, that the entire physical universe that is known to us appears to be made up of elements which are related to one another, some tightly and others very remotely. Furthermore, each entity in the universe which we examine closely then appears to be almost infinitely divisible into smaller elements which go together to make an infinite variety of subsystems. Furthermore, and more importantly, there appears to have been an evolution of systems over billions of years, an evolution which is particularly noteworthy to us here on earth where we have inferred the emergence of biological systems out of complex systems of physical elements and the emergence of the human being and his social system out of the biological. Social system continue to evolve in infinite variety before our eyes as man seeks to improve his situation on earth. Of all the systems known to us, the individual human being is the most remarkable, capable of innumerable creative acts, self-reflexion, self-enhancement, and indeed capable of both understanding and manipulation of many other physical and biological systems to enhance his or her own sense of well-being. The peoples of the world are of accord in respecting and desiring to enhance the well-being of all individual fellow human beings, even though they often advocate very different means for so doing. Nevertheless, it is in pursuit of such enhancement that humanity is ever organizing and reorganizing itself into social systems and subsystems. Sometimes these efforts fail and the separate human sub-units go their separate ways. At other times, the system becomes so strong that it overwhelms the individual members within it, subverting the goal of human enhancement. Furthermore, systems which have developed to enhance the lives of one set of human beings may find themselves incompatible or at odds with the enhancement of another set of human beings, and thus we have disputes, wars and revolutions.

In any analysis of innovation in the developing world we are first and foremost concerned with the independent political state as a system. Thus, for the remainder of this analysis we shall use the political state as our prime example of 'system' even though the concepts apply equally well to smaller units of analysis. Some basic elements of a political state are the following: the *human* elements, i.e. the people as individual members; the *families* (clans, tribes, sects), i.e. clusters of individuals who have stronger ties to each other through blood relationships, language, religion, common historical roots, or some combination of these things; the *geographical* regions; the *economic interest* groups, i.e. those who depend on one or another type of work setting to earn their livelihood, such as farming, mining, industrial production, etc.; and the *political factions*. A political state is a system to the extent that it is able to unify, inter-relate and harmonize these elements.

The education system of a country is, in fact, a sub-system which in many respects has the function of bringing together the five elements identified above so that the political state, itself, can achieve the status of 'system' in the fullest sense. This is particularly evident in new nations. For example, by means of the education system it is possible (a) to create a sense of national identity through the teaching of history and current events, (b) to provide a common written and spoken language where none may have existed previously, (c) to instil a common set of political and social values, and (d) to provide the specific sets of technical skills which will allow a balanced and integrated economy to come into being.

What does it mean to 'complete' a system?

'System' must be understood as a relative concept; it is a set of elements which has some degree of unity but this 'degree of unity' may be weak, moderate, or strong. Systems which are being created or which are growing may be said to be moving toward a greater degree of unity or toward more completeness. Systems which are decaying or disintegrating, on the other hand, may be said to be moving away from completeness, or towards a lesser degree of unity. Incompleteness of systems in human or social terms can be expressed in many ways. For example, 'confusion' or 'disarray' indicate a failure of various parts to come together. 'Conflict', 'factionalism', and 'dissension' suggest another type of incompleteness which may be more institutionalized; they also suggest that the system contains two or more subsystems whose elements are far more tightly bound to each other than they are to the larger system. Terms such as 'need', 'deficit', 'problem', or 'deprivation', on the other hand, indicate still another kind of incompleteness in achieving a desired end state or goal. Sometimes this is expressed by the term 'underdevelopment'.

There are several different senses in which a system may be said to be incomplete. First of all, it may appear to lack elements, i.e. to be too small or to have too few members to achieve the goals it has set for itself. It may also be too large or have too many elements, or elements which cannot be successfully integrated with the rest. In this case, moving toward completeness involves a subtraction of certain elements. A third sense in which a system may be incomplete is in the degree to which the elements are interconnected or interdependent. The geographical separation of the regions of a country, for example, almost always constitutes a severe problem for building or preserving national unity.

A system may also be incomplete in time, i.e. unable to maintain itself at a satisfactory level of completeness from one time to another. Hence, systems require means of self preservation or maintenance, and can be said to be incomplete to the extent that these preservation/maintenance mechanisms are not present. Indeed, the notion of preservation is vital to an understanding of human and social systems, for such systems always seek a state of *equilibrium* or balance of elements within themselves. This equilibrium is being continuously upset by changes both among system elements and in the surrounding environment. It should be noted that the concepts of 'maintaining equilibrium' and of 'striving for completeness' are close in meaning to each other, but not identical, because a system can reach a level of equilibrium without being complete. To explain this distinction further it is necessary to introduce two additional concepts, system 'openness' and system 'development'.

'Openness' is that quality of a system that allows changes to take place easily, either through rearrangements of internal elements, through the easy and rapid flow of information, resources, and personnel from unit to unit, or through the easy and frequent exchange of elements with other systems and with the environment in general. All systems are open to some degree, allowing some amount of flow within themselves and some amount of exchange with the environment. This is particularly evident in biological systems which, in fact, survive through a continuous process of intake (eating) of new elements from the environment (food) and evacuation of other elements (waste). To some extent, social systems operate in the same way. Independent political states achieve stability and prosperity in part through maintaining a constant flow of imports and exports but also in part through maintaining barriers to outside influence so that internal institutions and economic enterprises can develop in an independent manner without too much reliance on less dependable external suppliers or markets. Education systems, more than any other social institutions, illustrate this flow-through phenomenon; they are systems whose entire meaning is concentrated on the intake, processing and output of people. Thus education systems must be continuously open and must organize themselves internally for the smooth transition of those who are being educated from one year to the next, from one skill and knowledge level to the next, and so forth.

The word 'development' unfortunately has many different and not always compatible meanings, but in the present context of 'system development' is used to refer to a transformation from a status which is, by some definition considered to be 'less satisfactory' to one which is 'more satisfactory'. This 'less satisfactory' condition may be in terms of material well-being, equilibrium, completeness, power, or some other definable dimension of improvement. The notion of 'development' has a reasonably clear meaning with reference to individual human beings as systems. From conception to birth to various stages of childhood to adulthood the human being goes through many transformations in body and mind. Some of these transformations take place very gradually and at a more or less even rate while others come quite suddenly at certain points in the life cycle and do not recur. It might, therefore, be said that within the individual human being there are both evolutionary and revolutionary processes at work. Both processes contribute to what is called 'development'. Furthermore, as the human system moves through these transformations, it retains its status as a more or less complete system at each level. Thus, on the one hand, the development process can usually be seen as a system completion process. On the other hand, if development brings about a major change in the constitution or configuration of elements or in the process of problem solving, it then becomes necessary to use terms such as 'system transformation' or 'revolution'.

Development in political states (i.e. national development) may be thought of in similar terms. At any point in time, a political state is a system whose elements cohere and harmonize to give some level of equilibrium. At the same time, there will be many gaps, many missing elements and many poorly connected elements.

The sense of cohesion, of belonging to one country, will be stronger for some than for others. There will be serious shortages of manpower and material to meet the collective needs of social well-being and security. Perhaps most troublesome of all, some subsystems which are supposed to make a vital contribution to the whole will want to go their separate ways, achieving their own cohesion and internal equilibrium with disregard, if not deliberate avoidance, of their potential contribution to the greater system. These are some of the basic and inevitable strains of nation-building, and they provide the context within which most efforts of educational innovation must be viewed.

An emerging political state with such a condition of incompleteness or of severe underdevelopment may be, for that reason, extremely dependent on a stable external environment to provide and replenish those missing elements. Any instability in the environment caused by such events as an oil embargo, a closing down of assistance projects or a world-wide inflation leads to greater strain on the internal elements, and imposes a continuing threat that the equilibrium will be upset either from internal or external changes. Thus, even as a matter of survival, the political state strives to complete itself, to create or internalize as many of those missing elements as possible. For example, a country which has been dependent on grain imports to feed its people strives to improve its own agricultural production by training farmers in the use of newer methods, by building a production and distribution mechanism for higher yield seeds, by building fertilizer plants, perhaps by developing petroleum resources to feed these plants, and so forth.

Most often, development in the system completion sense is expressed in terms of quantitative growth or numerical increase of this or that desired element, e.g. more children in school, more schools, more teachers, more literacy, more production of a certain commodity. It is assumed that, as goals are reached for each of these elements, the political state will achieve a more satisfactory level of equilibrium and well-being and thus enter the ranks of the 'developed nations'. There appears, however, to be no clear end to this development road.

A brief look at these so-called 'developed' nations is sufficient to realize that there is no such thing as being completely developed, for even the most prosperous and technically self-sufficient nations are striving for various kinds of reforms and transformations. Indeed, the most voluminous reporting on the subject of innovation in education comes from the United States, which by some definitions is the most 'developed' of all countries. Thus it appears that, as development proceeds, the goals of development and of the system change. Sometimes, they merely expand quantitatively (e.g. more people trained, more school grades covered, more regions included). Sometimes they turn in other directions, new ones being added, old ones dropped or modified. As in individual development, there are periods when this evolution is relatively smooth and continuous, but there are also times of uneven development when goals change rapidly and dramatically, when the old system seems to be no more, or when it has totally transformed itself. It is important to consider also development in the more revolutionary sense of a transformation of the system as a whole into a different kind of system either with different goals, with a fundamentally different structure, with a different set of processes for achieving goals, or perhaps some combination of all three.

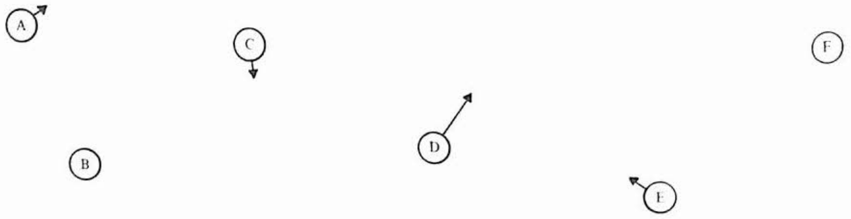
What does it mean to 'create' a system?

Many of the developing countries find themselves in a situation where much is to be done from a very limited resource base. Hence they are really in the business of creating a system where none existed previously or where the previous 'system' was hopelessly inadequate to fulfil national aspirations. The act of forming a political state is the most obvious form of system creation; separate regions, interests, languages, ethnic groups and political factions must be brought together in some way, must see a common interest, and must work together toward the concept of nationhood. An analogous act of system creation must take place after major political upheavals and revolutions. Yet the creation of a new country or the establishment of a radically new political order usually will create only the *ideal* of a new system, not the reality. New subsystems for transportation, communication, commerce, health, education, and so forth must also be assembled. In no case will these subsystems spring forth instantly from nothing; often they will emerge from the old and inadequate systems which already existed before the political upheaval. A theory of innovation must look carefully at the process by which these creative transformations come about.

What constitutes a system? Successive criteria

From what has been said above, one point about the concept of system should be clear: it is a relative concept. All systems seem to be on their way somewhere, either on their way to becoming more complete or on their way from being complete. All systems can thus be said to fit somewhere on a vast continuum from 'chaos' to 'total completeness'. It may be helpful here to illustrate these abstractions by some simple drawings. These drawings do not really picture social systems but they at least suggest some of the concepts in a visual medium. The figures begin with extreme simplicity and gradually become more complex. Figure 1, for example, merely suggests that a random set of elements scattered in a random manner through space do not constitute a system unless and until some rationale is offered for grouping them. Figure 1 could also be labelled 'chaos'.

FIGURE 1. Non-system: random unrelated elements.



There are levels or stages of completeness which distinguish 'more developed' from 'less developed' systems (and countries). We propose five levels as follows in ascending order: relation, connexion, cohesion, dynamic connexion, and dynamic cohesion.

1. *Relation* is the most rudimentary criterion of whether or not a system exists. A number of persons or groups or tribes which inhabit the same region may be said to be related in a geographic sense, even though they may be only dimly aware of each others' existence. Thus, for example, the various peoples which inhabit a continent like Africa may be perceived as one, albeit poorly articulated, 'system'. The basis of a 'relation' may be something other than geography, of course, as for example kinship, similar attributes or functions, complementary attributes or functions.

FIGURE 2. Lowest order of system : related groups.

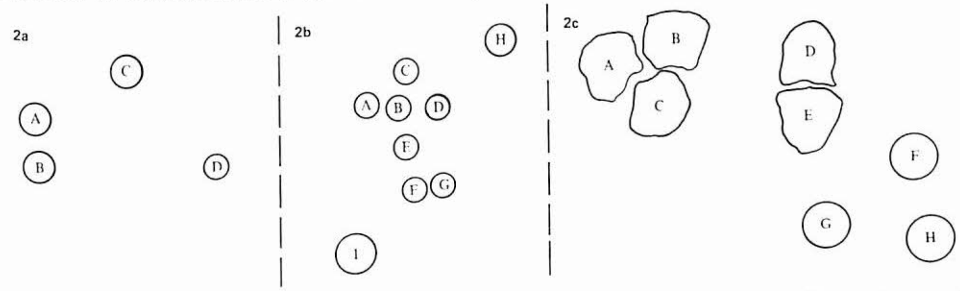


Figure 2 illustrates spatial relations only. Relatedness could be on any dimension such as colour, similar or complementary shape, size, age, sex, education, ethnic origin, political-religious beliefs, kinship, etc. Figure 2a shows A and B as belonging to a system but C and D more or less outside it. Figure 2b shows A to G as members of a system but H and probably I outside it. Figure 2c shows two or three systems, depending on how tightly we wish to define spatial relatedness. ABC and DE are clearly systems, but FGH may be one also; in fact A to H could be viewed as one system with either three or six sub-systems. Relation-based systems are often perceived as unified 'systems' more by outsiders than by their own members, but this perception itself may drive the members together to a higher order of system, namely:

2. *Connexion*. When units or persons with a given relation begin to make contact with one another, they move to a new level of 'system'. In fact, the more contact there is on more levels with greater frequency, involving more spheres of activity and interest, the more we can say there is 'system'.

FIGURE 3. Connected systems.

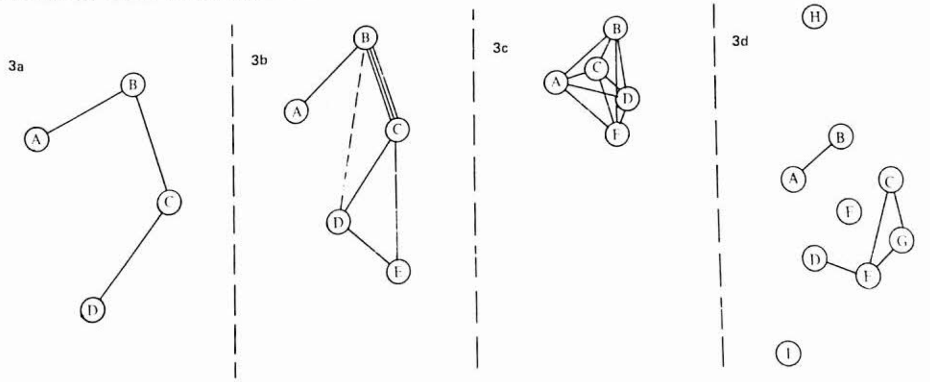


Figure 3 illustrates a number of possibilities for connected systems. 3a shows minimal connectedness, weakest for A and D; 3b shows some of the variety which is possible, including multiple connexions (BC), strong *vs.* weak connexions (DE *vs.* BD), networks (BCDE) and subnetworks or cliques (CDE); 3c shows a highly interconnected system; 3d shows a relational system (A to G) in which only two cliques are actually connected. Connexion starts with communication, but it ultimately involves much more: exchange of ideas, goods, money, people and processes. The more thoroughly interconnected the elements, the more they represent a 'system' together. Indeed, the building of connexions is often perceived as the vital step in the building of viable nations. Such, for example, was the perceived role of the construction of the Canadian Pacific Railroad from the east coast of North America across the prairies to the west coast in the late nineteenth century. A similar involvement of transportation systems in nation-building is still very much in evidence in the developing world today. For example, the emergence of Papua New Guinea as a viable and unified State probably depends to a significant degree on its national air service which is the only practicable and rapid link among its major population centres.

3. *Cohesion*. When related and connected persons or groups begin to develop a common identity, common attributes, common boundary, and a sharper awareness that they are parts of one common enterprise, a system can be said to have moved beyond connexion toward cohesion. From some points of view a true system does not exist until there is such cohesion; it is certainly true that there is no self-awareness of system until this state is achieved but even cohesion is a very limited state.

FIGURE 4. Cohesive systems.

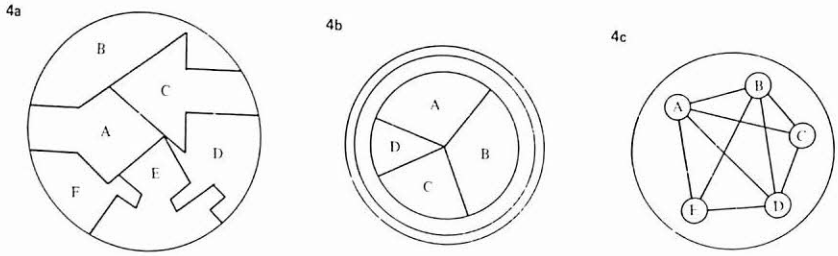
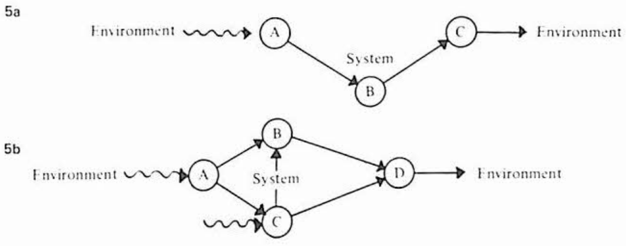


Figure 4 suggests only three of the many ways in which elements can form a cohesive system. 4a suggests interlocking or interdependence; 4b introduces the idea of bonds or boundaries which keep the system elements together (such as shared values, common ennemies, common goals, or either voluntary or forced containment); 4c points out the fact that very strongly and highly interconnected systems will necessarily become cohesive. Cohesion is not necessarily voluntary but may be imposed by force from aggressive and self-appointed leaders. Indeed, when certain persons seize control of a territory and its peoples, they will often see their first stabilizing task as one of imposing a kind of cohesion which may consist of erecting barriers, prohibiting movement in or out, and laying down strict rules and regulations as the enforced 'norms' of the new 'system'.

4. *Dynamic connexion*. When the parts of a system begin to be interdependent, when they begin to influence each other and to perform tasks jointly, we can begin to speak of dynamic connexion, as distinct from mere connexion.

The arrows in Figure 5 are meant to suggest the action of one element upon another. 5a indicates a linear dynamic interdependence from A to C: when A is influenced by something in the external environment, the stimulation is passed on in some form (not necessarily identical) to B and then to C. It may be, for example that A has sighted a danger which C is not yet in a position to see; the signal from A alerts C and may give C time to take defensive action. 5b shows a more complex dynamic connexion in which D may receive messages of varying intensity from

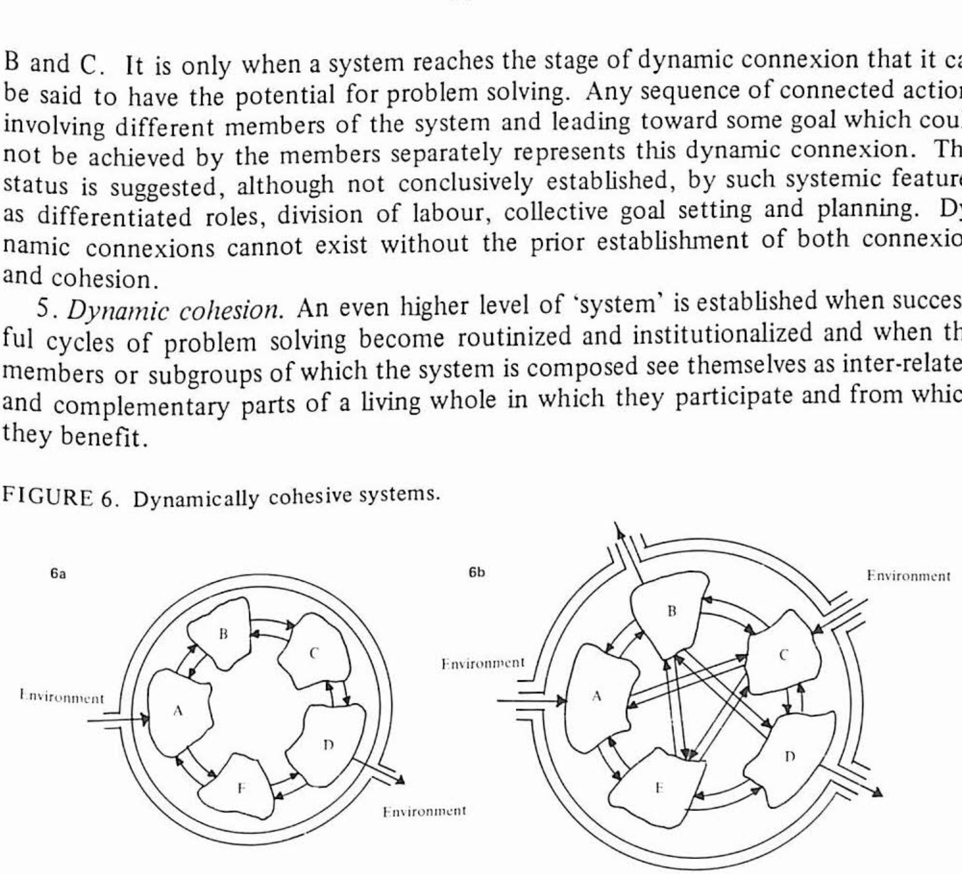
FIGURE 5. Dynamically connected systems



B and C. It is only when a system reaches the stage of dynamic connexion that it can be said to have the potential for problem solving. Any sequence of connected actions involving different members of the system and leading toward some goal which could not be achieved by the members separately represents this dynamic connexion. This status is suggested, although not conclusively established, by such systemic features as differentiated roles, division of labour, collective goal setting and planning. Dynamic connexions cannot exist without the prior establishment of both connexion and cohesion.

5. *Dynamic cohesion.* An even higher level of 'system' is established when successful cycles of problem solving become routinized and institutionalized and when the members or subgroups of which the system is composed see themselves as inter-related and complementary parts of a living whole in which they participate and from which they benefit.

FIGURE 6. Dynamically cohesive systems.



Moving up the ladder of system evolution it becomes increasingly difficult to offer meaningful diagram analogues, but 6a may suggest some aspects of both cohesion and dynamism. The elements ABCDE not only affect one another but are able to provide feedback to one another. There is both a division of labour (input, output and mediation specialists) and an interdependence of functions. 6b merely shows this at a higher level of complexity.

No doubt, higher levels of system can be postulated, but these five are sufficient for an introduction to 'system' concepts. A final observation should be made however to relate this five-level model to the reality of innovation projects. A carefully planned project sometimes creates the illusion of dynamic cohesion in a setting in which only the barest minimum of connexions and very little actual cohesion exist. There is nothing necessarily misguided about such elaborate planning as long as it is accompanied by a firm appreciation of what can reasonably be expected and as long as real project results are measured in these terms. If, for example, a project seeks to raise the level of literacy by means of radio study groups and then is only able to increase radio *listening* without measurably affecting literacy, it may nevertheless have served as a very important purpose in increasing the level of *connectedness* in the country. Connectedness and not literacy may in fact be the overriding system need at that particular stage of national development. Thus a systems view of innovation which takes account of the level of system already present may allow us to identify a range of important and desirable outcomes outside the thinking of the innovators themselves and perhaps more important for national progress than the goals which these innovators had planned and worked toward.

What is 'system change'?

System change is any event or action which alters the level of completeness or equilibrium. It may be the action which moves toward equilibrium or it may be the action which threatens it. It may be growth but it also may be decay; it may be building but it also may be destroying. The various types of system change can be identified in terms of their sources. At least seven types can be listed.

1. Change from new inputs: new people, information, or actions which come from outside the boundaries of the system will always pose a threat to equilibrium. For this reason, the most conservative and self-protective systems try to build and maintain barriers against any intrusion from outside; all outsiders are perceived as potential invaders and destroyers. Such a protective-defensive attitude is always at least partly justified. There is almost always something unpredictable and hence dangerous about new inputs. Furthermore, there are times in the course of national development when a preoccupation with internal processes is healthy.

2. Change caused by continuing failure to achieve internal equilibrium. This is essentially the system-completing change process already described.

3. System development: closely related to system completing but more clearly oriented to basic changes in the process and configuration of the system as a whole,

4. System decay, including the exhaustion, erosion, or dissolution of components and of the system as a whole. Departure or death of key persons may be one common type of system decay. Both the manifestations of decay and the measures taken to counteract decay are important types of change processes. Civil wars are one obvious item in this category.

5. Output depletion: the release of persons or materials (e.g. exports) creates within the system a further disequilibrium which must be made up in some way, either by regeneration from within or by imports. In developing countries, foreign exploitation of mineral reserves is one type of concern in this category. Of equal importance is the 'brain drain' which draws away the most highly skilled professional manpower to higher paying jobs in more developed countries.

6. Fusion with other systems. When a system merges with another system, all sorts of subsystems are put in disarray and must grope for a new state of equilibrium involving many new elements, some of which will be incompatible. Unification can be almost as traumatic as civil war for the people involved.

7. Innovation: is a special type of change which could include any of the above types. It is best defined as 'a deliberate effort directed toward the significant improvement of the system'. In what follows, we will aim at a more complete definition, but since this entire volume is concerned with the subject, the most complete definition may not emerge until the whole has been presented.

What is innovation?

It is proposed that *'innovation'* represents a *'significant new effort to complete a system or to create a system'*. Starting with this simple formula, it is possible to build a reasonably complete theory of how innovation takes place in social settings, and particularly in this instance in the developing world. The four key terms in this formula are: 'system', 'to complete', 'to create' and 'significant new effort'. The first three terms having been introduced in the preceding pages, only the fourth remains to be considered.

What is a 'significant new effort'?

As noted earlier, systems strive for a completeness which they will never achieve in a struggle which is on-going and never-ending; they are continuously importing and exporting elements in an exchange with the environment; at the same time, systems continuously readjust internal elements to achieve some level of equilibrium. Such changes are a natural aspect of the phenomena of systems at both the individual human and the social-political levels and are so commonplace that they do not usually deserve the designation 'innovation'. However, when several such change phenomena occur simultaneously or when their frequency suddenly increases markedly, they are displaying one of the signs of 'innovation'.

This pattern is clearly displayed in developing countries which are attempting to reform their educational sturctures. Such countries almost always start with an existing structure, often one which is left over from colonial times. In any case, this pre-existing structure is inadequate and incomplete. It allows a very small number of persons to enter and allows even fewer to progress to a point where they are sufficiently trained for the technical, managerial and professional roles which the society so desperately needs. The major effort may be simply to expand this system but usually the expansion goals will be dramatic, e.g. to double enrolments at different levels; this expansion effort may well be significant but since it is essentially aimed at furtherance of the traditional objectives that were implied by the old system, it does not deserve to be described as new. In the course of many such expansion efforts, however, it eventually may become apparent that expansion goals (a) cannot be reached by traditional means, and (b) may not be appropriate goals after all. Thus, as major changes in either means or end are introduced the project becomes an 'innovation'.

System components

Most studies and documents which report on innovation are reporting on the substance of the innovation; in other words, they provide descriptions of the new programmes, materials, practices, software and hardware which are to be created, introduced and implemented. These are the missing elements which will supposedly bring the system nearer to completion or to a more satisfactory equilibrium. Sometimes they may even represent the transformation of one system into another (an example of 'system creation'). In education, such innovations may cover a wide range of phenomena including curricula, teaching and learning methods, equipment, school buildings, middle schools, community schools, comprehensive schools, open schools, administration, out-of-school programmes, electronic media use, teacher training institutes, educational research centres, curriculum development and production centres, and all kinds of non-formal and adult programmes. A list of the innovations which are being carried out in all the countries of the world today would be both staggering and impressive, but to develop such a list is not the primary purpose of this document. Rather, our concern is with the *process of innovation*, that is, in presenting an analysis of *how* innovation takes place in developing countries. This 'how' is first of all a sequence of events over time from the origin of the need and of the idea that a change was possible, desirable or necessary to the final achievement of the change which was contemplated.

What is the process of innovation?

It is important to think of the process of innovation simultaneously in five somewhat different ways:

1. as a *sequence of events* over time, beginning with the first recognition of the need for and the possibility of change and ending with the complete installation and acceptance of that change;
2. a set of *people and institutions* who are tied together in some way as the creators, planners, implementors, decision makers and users of the innovation;
3. a series of *transformations* of ideas and resources into materials, practices, institutions, and actions;
4. a *problem-solving* sequence in which needs are recognized and defined as problems and in which solutions are subsequently discovered and applied to those needs, leading to their satisfaction; and
5. a temporary *system* which is (a) composed of many integrated elements, a system which has (b) recognizable input, throughput and output subprocesses, a system (c) composed of people and institutions, organized usually on a temporary basis, to get the task done, finally (d) a system of functions and actions interrelated to solve problems around a focal need area.

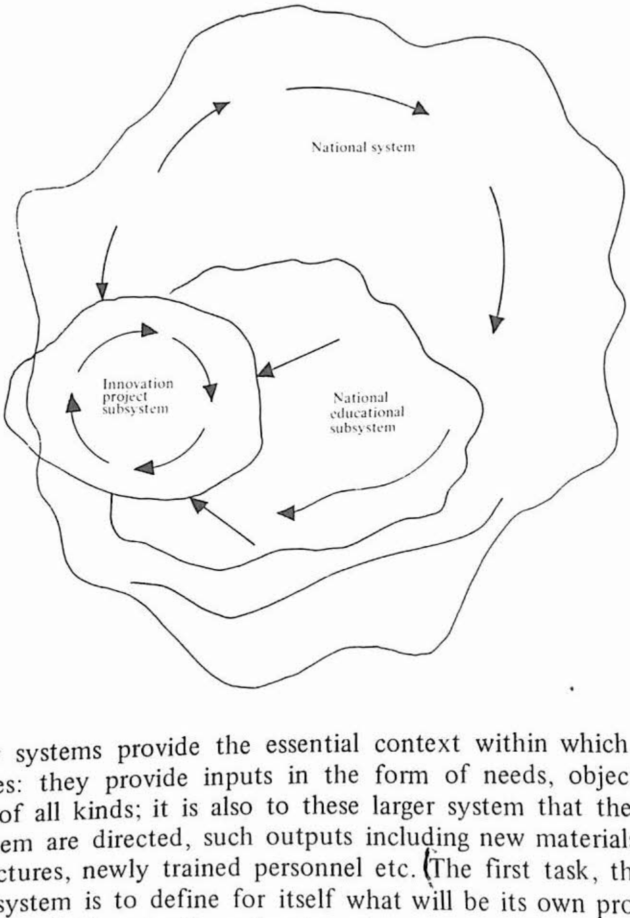
The task of documenting innovation processes would be made easier if there were a simple and constant relationship among these different aspects. For example, there is always some identifiable sequence of events but this sequence may not correspond in a simple or direct way to any particular sequence of problem-solving steps: e.g. needs may be thought of clearly only after a project has begun, and it may be necessary to re-arrange the problem-solving process two or more times before implementation is achieved. Furthermore, it is often difficult to determine exactly when a project began and when it ended; most of the documentation which we are likely to find will be written before the project is fully implemented, often before implementation has begun, and rarely after the full consequences have been experienced and evaluated. Similarly, people are not always easily identifiable with particular tasks, and the institutional structures which are likely to be involved will differ widely from case to case; such variation from country to country will be particularly noteworthy for non-formal education projects since, by definition, these projects exist outside the traditional structures of education which are quite similar across the world (e.g. the classroom, the school building, the teacher, the headmaster),

As a system, an innovation process is not only temporary but it is also extremely open and incomplete; it will, therefore, be very difficult to achieve any level of equilibrium; for this reason, it is usually quite vulnerable to changes in the social environment and can be destroyed by the sudden loss of some elements or the sudden intrusion of others. As a 'significant new effort' it arises quickly and dramatically, often inspiring intense hopes *and* fears in those affected by it. But the hopes may die prematurely, undermining support for the project long before it has had a chance to show its benenfits. Indeed, *it is the fragility of the innovation process as a system which makes knowledge of how it works in different settings so important*. There are so many ways in which an innovation project can fail that only through careful and expert planning of the innovation process itself can the innovator be reasonably sure of putting together and maintaining a functioning system.

Elements of a theory of innovation process

From what has been said above it should be clear that an innovation process is a system within a system within a system and this can be shown on Figure 7. That is, the largest and most inclusive system is the developing country *as a whole*. This entity is the principal object of concern and its development is the primary rationale of innovative efforts in all spheres. Within this largest system there exists the education 'system', including both formal and non-formal elements; a principal purpose of this education system is to further the development of the country as a whole through the provision of skilled manpower for various roles and through the teaching to new generations of the over-all goals of the society and the means for their fulfilment. An innovation project is yet a third system within this system which comes into existence for the specific purpose of transforming and upgrading the education system. It is vital to recognize at all times the essential interdependence of these three levels of system in successful innovation. An innovation project may be better organized and more coherent than the larger systems into which it enters but, as a highly visible intruder, it may find itself subject to various pressures and counter-influences from the larger systems. Some will be pressures to integrate, some will be pressures to separate.

FIGURE 7. An innovation project is a system within a system within a system...



The larger systems provide the essential context within which the innovation system operates: they provide inputs in the form of needs, objectves, personnel, and resources of all kinds; it is also to these larger system that the outputs of the innovative system are directed, such outputs including new materials, policies, practices, and structures, newly trained personnel etc. The first task, therefore, for the innovative subsystem is to define for itself what will be its own procedures and definitions for essential inputs, throughputs and outputs. These could collectively be defined as the *procedural configurations*. This procedural configuration must include a delineation of the problem-solving process to be followed, the essential functions which must be performed, and the sequence in which they must be performed)

The procedural configuration, by itself, is not a system in the dynamic connexion sense but only the idea of such a system. To bring it to life, three other essential elements are also needed: *people*, *resources*, and *connexions*. People are needed to perform the specified functions; resources are needed for input and processing to bring about the desired transformations and to support the people; and connexions are needed to bring the pieces together and to keep them together, to maintain the integrity of the whole, and to ensure that the system on paper is a system in fact, with each part interrelated and interdependent with the others to fulfil their common mission. Connexions are also required between the innovative system and suppliers of resources; some of the most important resource suppliers belong to the larger systems, the education system and the politic-social system of the country as a whole, but some important suppliers are also external. Finally, connexions are required at the output side to ensure that there are adequate channels of distribution and placement for the material and human products of the system.

What we call 'procedural configuration' is related to but not identical with the official plan or proposal for the project. The latter usually appears as a document and will sketch out aspects of the procedural configuration but usually only in very incomplete form. Efforts to improve project proposals are often aimed at making the proposal conform more closely to the procedural configuration.

CLARIFICATIONS

Quasi-systems: relativity of the concept of 'system'

No system exists in any absolute sense, and the concept is more or less an arbitrary one. In other words, any set of elements can be described as a system if we think they *ought* to go together for logical or any other reasons, even if these elements do not go together very well in the sense of being connected or cohesive. In such a case the term 'quasi-system' could be used. Many innovative projects do not meet all the criteria of being either dynamically connected or cohesive, but still deserve the label of 'system' or 'quasi-system' until they reach the point of decay or dissolution, at which no-one can any longer perceive any relatedness of elements whatsoever.

System size

A system can be of any size. The universe itself is a system, as are the smallest atoms. In sociological terms, any pair of individuals can constitute a system. In fact, pairs of individuals who live or work in close proximity almost invariably move up the 'system' ladder to dynamic connectedness in very short time. This means, of course, that an innovation project which brings together large number of people in a working relationship will inevitably be creating many hundreds of smaller, usually informal, systems as it develops. It is probably true that systems of a certain size performing a certain function are more stable and more successful than others, but social sicence cannot yet tell us what these optimum sizes are.

Sub-systems and super-systems

It follows from the above discussion that all systems contain and are made up of other smaller systems which can be referred to as sub-systems. It also follows that almost all systems belong to or are contained within even larger systems which have varying amounts of influence on their own functioning. In a period of national consolidation, for example, the national government and the nation-as-system come to have a more and more dominant (and perhaps dominating) role in many of the subsystems of which they are composed. At the highest level it is becoming increasingly clear to thoughtful people everywhere that the people of the earth as a whole and their governments together constitute one 'system', however imperfect and disunited that system may be. Internationally supported aid and innovation projects represent a visible, even if feeble, manifestation of that fact.

Inter-system relations

It also follows from the above discussion that systems live in an environment of other systems in addition to those of which they are a part. When they become related to and especially when they become connected to these other systems, it becomes possible to speak of inter-system systems. In the present context, internationally sponsored educational innovation projects represent inter-system connexions; to the extent that these connexions lead to the solution of problems, it can be said that a super-system has been created which includes both the national government and the international agency.

A theory of systems vs. *a theory of change* vs. *a theory of innovation*

At the most general level, all of the propositions of this chapter belong within the framework of a theory of systems, but more narrowly we will concern ourselves with how and why systems *change*. Our ultimate concern, however, is not merely to describe these natural phenomena, but to analyse existing theories of *deliberate changing* to which we apply the term 'innovation'. At the end of this chapter, we will go one step further to suggest an optimal model or strategy for deliberate changing. Thus, we will attempt to apply the general theory at four levels of increasing specificity and applicability.

System creation

A striking convergence of systems theory and innovation theory is produced by juxtaposing two facts: first that to create a viable social system is extraordinarily difficult, and second that innovation is an act of system creation.

WHY CREATE SYSTEMS?

If it is so much trouble, why is it important to create systems anyway? There are at least two important answers to the question. First, many of the countries or nations in the developing world are, in fact, involved in the process of *creating* social systems, taking people in a designated region (relational system) who neither know each other nor percieve any common purpose and often do not even speak the same language, connecting them, making them cohesive, and finally making them dynamically connected and cohesive. Furthermore, many of the new nations are trying to do this job in a very short time, hoping or expecting that somehow they can condense into a few years or perhaps decades processes which took other cultures centuries. The activities connected with the creation of a national system will profoundly affect every aspect of life in that society and will also necessarily affect any educational activities, innovative or otherwise. As part of the national system creation, there will also inevitably be the creation of countless subsystems including education, small and large business enterprises, industry, agricultural and other types of collectives, a military establishment, and so forth. If all these are being created simultaneously, they will almost certainly affect each other, competing for scarce manpower and resources.

The second reason why it is important to understand system creation processes is the fact that the innovative project itself is a system which has to be created, and this is true whether or not it is intruding on a fully developed society or one which is being created. An innovative project may start out as a concept in the minds of a very few people; the concept eventually becomes a document which is approved by various peope, most of whom will have very little to do with implementation. But after this, suddenly within the space of a few months or at the most a year, people have to be assembled, uprooted from existing jobs wherever they were, assigned roles, and made to function as a working whole, supposedly as a dynamically cohesive whole. It should be no surprise that it often does not work out that way. Even though it is relatively small and relatively simple compared to a national state, a project is nevertheless a system and it will have similar or analogous pains of birth.

Precipitating conditions

There are at least six conditions which can be said to lead to the creation of new social systems.

1. Turmoil. This is the most general condition out of which systems emerge, a state of affairs in which there is a breakdown in vital services, in which people scramble for whatever is available, in which there is little which can be counted on to protect, feed, clothe and house self, family and community.
2. Break-up. Often caused by military defeat or revolution in which an old system has been essentially destroyed. Another 'break-up' condition is the withdrawal of a dominant or ruling group such as a colonial administration, either voluntarily, through loss of interest, economic or otherwise, or by moral, political, or military pressures, A third type of break-up is the dissolution of a political state into smaller fragments. In most of these case of break-up, certain important parts of the old order will remain and will be incorporated as part of the new, but often this will be done with extreme reluctance and only because the new rulers are unable to cope with the task of new system creation in its totality.
3. Aroused concern by the people as a whole. With the turmoil there is suffering, and out of the suffering there sometimes (but not always) comes an explicit or implicit demand for order, for regularity and predictability so that the small things of life can go on.

4. Mobilization of a concerned subgroup. More typically, some sort of 'party' will organize itself around some set of ideals, ideas, or values, bolstered by a sense of opportunity, and perhaps by a yearning for power and/or wealth.
5. Emergence of a leader. To many this will be *the* essential precondition for the formation of a social system; the leader, after all, is already a system unto himself (or herself on rare occasions). Thus the leader is a convenient symbol, and the emerging state can be imagined to be a reflexion of the coherent design which already exists in the leader's mind. We suspect that this is mostly an illusion but it is widely believed. There are at least three models of leader worth noting: the inspirational figure, the tyrant and the political organizer. All three can be combined, of course, but separately they lead to rather different kinds of problems and patterns for system creation.
6. Aroused concern from outside. Finally, there is the possibility that new systems may be precipitated by or with the essential encouragement of people from other countries or from international bodies. It is rare that an entire political state will be created from this basis but it is very common that essential subsystems, especially educational ones, will be established by outsiders, often designated as 'technical advisers'.

Associated conditions of system creation

Regardless of the source of new systems, there are certain phenomena which seem to be associated with system creation. These, more than the preconditions, are what should be most noted, for in these symptoms of the birth of societies we find many of the circumstances which make life difficult for prospective innovators. In the next chapter, we will dwell at length on some of the phenomena of system creation, in particular the contradictions and the confusion which come with the mad scramble to put things together. On the one hand, there is enormous fluidity and flexibility, structures being set up and torn down overnight, people changing roles and moving to the top and crashing to the bottom in quick succession. Newly created subsystems may have boundaries which are at one moment easily penetrable and open, at the next absurdly rigid and closed. There is an abundance of rhetoric and a shortage of almost everything else except people and problems. There are enormous gaps in the system, to the extent that sometimes it looks like a system, sometimes it just looks like somebody's cartoon of a system, sometimes like nothing at all. There is planning for the millenium and a demand for immediate delivery. There is wild hope juxtaposed with despair. There are shortages of almost all resources but examples everywhere of great waste of existing resources.

The point about all this is that such a confusing mass of contradictions *is* comprehensible as a symptom and natural by-product of system creation. First we need to imagine what it is like to have no system; then we need to respect the difficulty of bringing stable and functioning systems into being, starting from scattered, disparate and often competing and warring elements.

What has to be created?

At this point it may be asked what has to be done before a system can be said to have been created. For the answer we refer back to the earlier definition of system and especially the discussion of 'successive criteria' of systemness. Essentially, a system can be said to have been created where there are numerous and persisting interconnexions among members and groups; when there is cohesion in the form of shared identity observed, agreed, and/or obeyed norms, rules procedures, and laws; when there is a focus of concern and constructive action on common needs, especially for basic survival and mutual security; and, finally, when something which could be called a state of equilibrium has been established among the various elements. This equilibrium will be characterized chiefly by the reasonably steady and reliable flow of goods, services, and people through the various subsystems, and between the system and the neighbouring systems which make up its social environment. These are obviously rather broad criteria, and there is no one specific point at which we can say 'a system existed' or 'a system does not yet exist'. The discussions which follow regarding the development of systems and later the criteria for an optimal system should provide further clarification.

The illusion of creation

Having said so much about system creation, we now must add that such a thing hardly ever happens in pure form: nothing is created from nothing. New systems emerge from old systems or parts of old systems or multiples of old systems, and the new may be much more similar to the old than the new founding fathers are ever willing to admit. This is especially true of the people; it is the individual people who are the essential subsystems of any social system and most of these will not change in any major way in the transition from the old to the new. Therefore, 'creation' would be better thought of as a drastic rearrangement of elements which already exist. The more the system-makers recognize this fact the more likely they are to be truly innovative.

System development (growth and transformation)

In our initial discussion of a system we have already introduced the concept of development. It remains for us to spell out some of the more important implications of that concept such as growth gradients, types of growth, features of organic growth, and critical stages. We will also consider special aspects of innovative projects as developing systems.

Growth gradients

Systems which are in a complete state of equilibrium can be said to have a growth gradient of zero. This is by no means a ridiculous concept; indeed, many current writings by various social critics, particularly the critics of technology, advocate zero growth systems in which some sort of static harmony is achieved between man and nature and man and man. It is also true that certain civilizations have managed to remain remarkably stable in population, territorial coverage, technology level, etc., for centuries. On the other hand, it is becoming increasingly difficult to find such stable cultures and, for most of mankind, the trend, for better or for worse, is in other directions. Figure 8 suggests some possibilities.

FIGURE 8. Growth gradients: simple

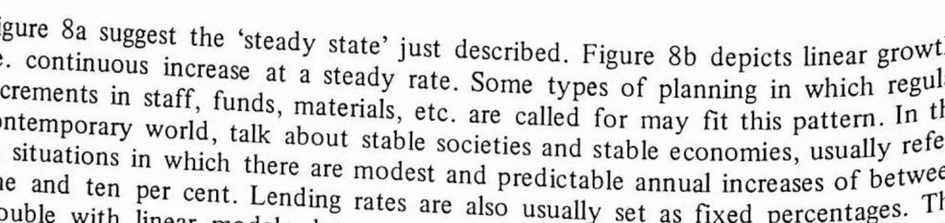
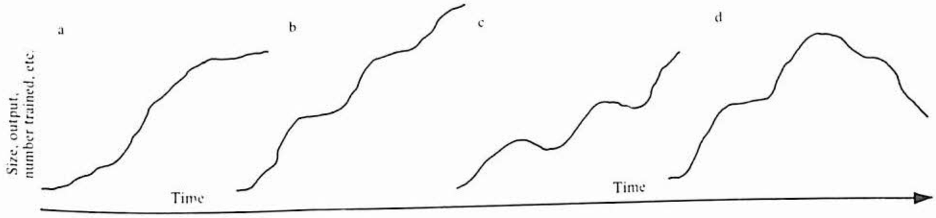


Figure 8a suggest the 'steady state' just described. Figure 8b depicts linear growth, i.e. continuous increase at a steady rate. Some types of planning in which regular increments in staff, funds, materials, etc. are called for may fit this pattern. In the contemporary world, talk about stable societies and stable economies, usually refers to situations in which there are modest and predictable annual increases of between one and ten per cent. Lending rates are also usually set as fixed percentages. The trouble with linear models, however, is that they rarely apply very well either to innovation processes or to the kinds of growth which are experienced by developing countries.

Figure 8c, 8d and 8e suggest three types of curvilinear growth. In Figure 8c there is a very rapid beginning period (perhaps as described above in 'system creation') and then a slowing down which may represent either stabilization or exhaustion or perhaps a reaching of the limits of growth potential. Figure 8d represents the all-too-common situation of a rapid rise followed by an equally rapid decline. Indeed, discontinuation of a project could mean a very steep downward gradient at the end.

Figure 8e suggest the exponential growth curve which begins slowly but continues at an ever increasing rate, reaching explosive levels. Both pessimists and optimists tend to make predictions in this form and it fits the way many people feel about innovation, both those who welcome it and those who fear it. This gradient also describes the way many innovation projects are planned, i.e. there is an initial discussion and planning period in which little is spent and few are involved; this is followed by the project organizational period in which more are involved at different levels and more money is being spent in larger amounts, especially for recruiting and publicity; then there may well be a 'pilot' period in which some implementation is done, a token number are trained, samples of products are issued; this in turn is followed by full-scale implementation in which larger and larger numbers are trained, vast sums are spent, and awareness and acceptance of the project expand throughout the country in a chain reaction (or explosion). It is doubtful that very many projects in reality conform to such a pattern, even though there are times when projects do accelerate very rapidly. If this happens, it should be evident that there will be enormous stress on individuals in key roles and an enormous stretching of any resources which might be scarce.

FIGURE 9. Growth gradients: complex.



Figures 9a through 9d probably represent gradients closer to what is experienced in the real world of people and social systems. Figure 9a is the S-curve of growth familiar to anyone who has studied the diffusion of innovative products and practices. First there is an exploratory period in which only a few of the most innovative people take the risk of trying the new product or practice. Then there is the critical moment when influential persons ('opinion leaders') begin to use it; they are quickly followed by the many others to whom they are socially connected, until a saturation point is reached. Later adopters come more slowly, either because they are more poorly connected to the others (isolates) or are more resistant to innovations in general (conservatives). The S-curve of innovation adoption is well described with many research citations from developing countries by Rogers and Shoemaker (3). The S-curve may also describe, in a looser sense, the sum of activities and energy investments of a typical innovative educational project in a developing country, at least as far as the international involvement is concerned.

Figure 9b may come even closer to a representation of real growth patterns, particularly as these are traced over a longer period of time. In fact no system can sustain a rapid level of growth for long periods of time: there must be periods of consolidation, integration, or perhaps simply rest. We suspect that social systems are not unlike individual people in this regard; there will be growth spurts, when perhaps one particular sector receives much attention, followed by periods where other aspects of the total system are allowed to emerge and bloom. If such spurts are summed across the whole system, the result will appear somewhat like the step-wise gradient of Figure 9b. It may also look like the foothill gradient of 9c. In other words, there may be periods of rapid growth followed by retrenchment as well as consolidation. Finally, we may have a 'growth' pattern such as in Figure 9d in which there are steps up and steps down. Again, this pattern may well describe the extra-national components of a well-managed technical assistance project. It also describes, in a metaphorical sense, the stages of the individual human life cycle.

This last set of gradients is very important for our theory of system development, for they introduce four more important ideas: spurts, plateaux, transitions and cycles.

1. Spurts in the natural rhythm of development are periods of extremely rapid growth. Sometimes such growth will involve only a single subsystem; sometimes the whole organism. A great deal of the visible growth of systems probably takes place during these spurts, but the growth is sometimes more apparent than real.
2. 'Plateaux'. Periods of rapid growth are succeeded by periods of minimal visible growth in which consolidation, evaluation, reconsideration, and integration may be taking place. These may be times when the innovation is transformed or adapted to meet better the realities of the system and the situation. They may also be times which sow the seeds for new growth spurts.
3. Transitions. Special significance may be attached to events and circumstances at the turning points from plateaux to spurts and vice versa. From the point of view of planning and forecasting it would be very desirable to know what are the signs which warn of such transitions, and to know what the probable duration of spurts and plateaux are for various kinds of systems.
4. Cycles. Implicit in what has been said so far is the notion of cycle, i.e. a repeated pattern of rise and fall in activity, of plateaux-transitions-spurts-transitions-plateaux succeeding each other in regular sequence. We suspect that most systems grow in this manner, yet the planning of innovative technical assistance projects does not always make allowances for such a pattern.

Types of growth

The 'gradients' discussed in the previous section provide important information about growth and development but not so much about what is going on. There are at least nine types of growth processes worth noting: expansion, multiplication, division, strengthening, loosening, balancing, differentiation, integration, and recombination.

1. Expansion is the simplest type of growth, suggesting 'more' or 'larger' without any changes in structure or function.
2. Multiplication suggests merely that more elements are added without changing basic structures or that more structures and subsystems are added or created which are identical to those already existing within the larger system.
3. Division is literally the opposite of multiplication but with the same result, that more elements, units, or substructures are created out of those which already exist without changing the underlying structure or function. Expansion may force multiplication or division, or the reverse may be true.
4. Strengthening signifies reinforcement or solidification of elements, structures, functions or subsystems which already exist, without changing the over-all structure. Sometimes we use the term 'institutionalization' to signify strengthening in a social sense. Strengthening may consist of increasing rewards or training for particular roles, or in providing more definition, legal status, and security. The negative side of strengthening is 'hardening', i.e. making the system or its elements more closed, less flexible, etc. Such is an inevitable concomitant of ageing.
5. Loosening is the opposite of strengthening but is likewise an important growth process. A certain looseness or elasticity has to exist before expansion, multiplication or division is possible, and these processes in turn lead to an inevitable stretching or loosening. The most positive aspect of loosening is 'openness'. As systems loosen up, they are more capable of taking in new elements and in engaging in other growth processes such as differentiation and recombination. The negative extreme is, of course, disintegration and decay, recognizable and inevitable parts of the life cycle of all human systems and many social systems.
6. Balancing could equally well be called 'filling in' or 'evening out'; at the beginning of this chapter we introduced the concept of 'completion' as an over-all term to

describe what systems try to do. Balancing is a somewhat more particular term for the process of filling in the gaps, making up for inequalities or disjunctures between one subsystem and another.

7. Differentiation is the purposive division of elements or subsystems in which they come to play complementary rather than duplicative functions in the service of the larger system. More developed systems are almost necessarily more differentiated. This is very obviously the case in the evolutionary scale of animals, but is thought by many to be equally true of social systems. The point is not without debate, however, since some important ideological groups view positive development as consisting of a simplification, a drastic reduction in the number of statuses, subsystems, functions, etc. Such a trend would constitute *de*differentiation. It has often been observed that elaborate bureaucracies are major impediments to change. Hence it may be that positive development requires, on the one hand, a certain degree of dedifferentiation (which inevitably occurs in social revolutions) which precedes a new kind of differentiation.

8. Integration primarily signifies the building and strengthening of connexions between elements or substructures within the system; from connexions emerge groupings of elements, networks, and structures. It is a particularly crucial form of growth for innovations and innovative subsystems at the point of transition after a growth spurt of multiplication and differentiation. It is important both to bind the new elements together and to tie them more closely to the larger (and older) system of which they are a new part. The opposite of integration, disintegration, may also be an important development process, a necessary precursor to many of the types of growth which have been listed above.

9. Recombination is probably a mixture of dedifferentiation, differentiation and reintegration. It is perhaps the most vital and certainly the most interesting of all the growth processes and probably takes place at transition points *preceding* a growth spurt. It is also a type of growth which is uniquely human and social. Recombination may signify a complete change in goals or functions or structure of the system.

These nine types of growth should also be considered in relation to the previous discussion of gradients. Some types of growth seem to be associated more clearly with spurts, e.g. expansion, multiplication, division, and differentiation. Others are more associated with plateaux, e.g. strengthening, balancing and integration. Finally, there may be some growth processes most connected to points of transition from plateaux to spurts and vice versa, e.g. loosening and recombination.

Development as organic growth

It is clear that when the term 'development' is used in the context of 'developing countries', the concept becomes extremely subtle and complex. We do not know where in the literature on innovation or change or development we can turn to derive a complete and satisfactory definition, and it is for that reason that we devote so much space here in an attempt to build one. First of all, it seems to us that 'development' has to be seen as an organic process, analogous in its complexity to the development of the individual human being. For this reason, we have intentionally borrowed concepts from psychology and particularly from the field of cognitive development (4). It is important, above all, to view development as a process which is both natural and organic. It certainly does not proceed along a linear gradient; it is most probably a stepwise gradient involving at different times all of the nine types of growth listed in the preceding section. It is commonly observed that developing countries lack the necessary infrastructures for a particular type of development or to absorb this or that type of innovation. In fact, however, there are within a country many *developing* infrastructures, each having its own growth pattern, competing with each other for scarce resources and feeding each other as their capacities allow.

There is a point at which the analogy between personal and social system development seems to break down. For the person the processes are largely inborn and, despite their complexity, they work themselves out over a period of a few years. For developing social systems there may also be a natural or automatic process by which stages are worked through but these natural processes, if they exist, are by no means so predictable and reliable. Furthermore, system development can be modified, to some extent controlled, and most certainly thwarted by the deliberate action of people. The question must therefore be asked, 'what does it mean to plan for organic growth?'. Clearly, it is necessary to move away from linear planning. It is also necessary to be more flexible and probably more opportunistic in the sense that people learn to recognize certain symptoms of development and act quickly to support them as the occasion requires. Interventions to foster development probably should be timed to coincide with certain 'critical periods' in the natural evolution of systems. One of our tasks in this monograph will be to identify the signs associated with such critical periods.

Critical periods

Critical periods are times of transition or creation at which systems are more open, more vulnerable, and exhibit more potential for change and innovation than other times. They are also times of convergence of social forces, when certain needs are just rising to the surface, when many people are taking a new look at what they are, where they are going, and where they want to go. System creation is, in a sense, the most obvious critical period but, over the course of several years, several additional critical periods may be expected to occur which come, in a way, as rebirths or recreations building on the foundations, rather than the ashes of the old.

Discussions of national development inevitably must turn at some point to the question of 'development for what?'. The naive answer of the technocrats of the 1950s and 1960s was development toward the status of industrialization and per capita gross national product of the so-called 'developed' countries. This view has come under sharp attack in the 1970s, but in spite of the ideological and rhetorical swing away from the technocratic answer, existing development efforts in nearly all cases reflect this conception. Our theory of development does not come down on one side or the other of this argument, however; we would prefer to say that there are critical transition points at which developing countries can and should reexamine their goals, consider what they mean by 'development' and orient their planning accordingly. Such a revolutionary step could be taken without violent upheaval and without undoing the system building efforts which have come before. Furthermore, the right kinds of international technical assistance at such points, especially in bringing to bear the experience of other countries which have gone through similar transitions, might be invaluable.

Innovation projects as examples of organic development

Most of the discussion so far has focused on developing countries and their subsystems as *the* systems of reference. But we have been saying all along that projects are themselves systems, and their proper management requires a profound appreciation of that fact. Yet in the context of the above discussion of organic development, clearly innovative projects are strange animals. First of all, they tend to be planned in a linear or simple curvilinear fashion. Second, they are planned not for survival but for self-liquidation, and third, they are planned for a life cycle so short that it might well be called frantic. The evidence which we have accumulated from our readings, from interviews and from our questionnaire study all suggest that real-life projects exhibit most if not all of the same patterns, e.g. growth spurts, plateaux, transitions, critical periods. In one respect, however, they are clearly different: they are *temporary*. This fact makes the later cycles of an innovative project particularly problematic since these stages are, on the one hand, supposed to be leading to permanent integration of the essential features of the innovation and, on the other, to the termination of the work of key members of the team. What is involved is a critical period in which there is both a transition and a *transfer,* hence a juncture between a system which is dying and one which is dynamic and growing.

Input Processes

At the beginning of this chapter, the basic dynamic process of systems was described as 'striving for completion'. In biological systems, equilibrium is achieved through the constant or regular intake of material from the environment, familiarly described as food, water, and air. Vital elements are extracted from this material and the remainder is expelled back into the environment as waste. The incorporated material, on the other hand, is supplied to the various subsystems of the body to make up their insufficiencies, and a good deal of it is transformed into energy which allows on-going mental and physical activity, the latter impacting again on the environment.

This biological systems model seems to apply quite well to various kinds of systems including nation states, business enterprises, schools, and projects of practically any size, duration or purpose, including, most certainly, innovative projects. In most general terms the model is composed of two entities, the 'system' and the 'environment', and three processes which relate the two, 'input', 'throughput', and 'output' (see Figure 10). It has proved to be a very convenient way to analyse what is going on in very complicated situations, and we will use it extensively in the remaining chapters to classify and explain many of the aspects of the innovation process. The next three sections lay the basis for this analysis.

FIGURE 10. The Input-throughput-output model of a system.

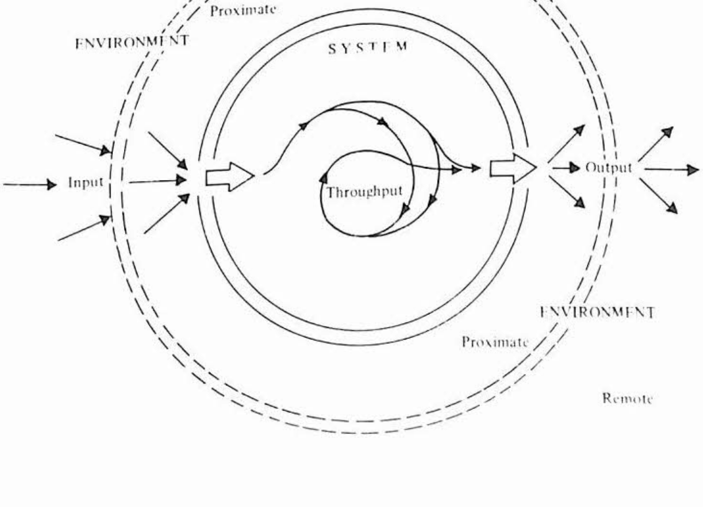


Figure 10 introduces another important distinction regarding the environment: there is not just one environment; there are many. For simplicity we have made one division only into proximate and remote. The proximate environment could be thought of as an extension of the system, a part of the system, or the territory of the system, just as the land area covered by a nation state is thought to be both a part of the state as a system and also the environment of the system. This proximate area will also be referred to as the 'internal environment' of the system. Thus it is important to consider inputs from (and outputs to) both the proximate and remote environments as separate issues.

Remote inputs

For a country, remote inputs are principally those things which must be imported from other countries. These may include raw materials, manufactured goods, food, transient visitors, immigrants and other such tangibles. What we will be more concerned with are the less tangible items such as technical assistance, training, new ideas, methods, and innovative practices and structures.

An innovative technical assistance project is a particularly complicated type of input, however. In the first place, it combines several types of input, tangible and intangible. In the second place it requires matching commitments of internal resources (proximate inputs) and commitments to make various kinds of changes in structure or process. In the third place, this kind of input is of relatively short duration; hence it cannot be depended on to fill any long-term system need. The key work here is 'dependency'. How does a country accept remote inputs without being or becoming dependent upon them and hence suffering crisis when those remote inputs cease? The catastrophic effects of the oil embargo on the economies of non-OPEC developing countries is only one dramatic case in point. In our interviews we found at least one clear case of over-dependency on externally funded education projects. This developing country had a series of technical assistance projects related to teacher training over a period of more than 20 years; for many years projects were generously supported by a bilateral source; this source withdrew after persistent evidence that there was no internal planning for continuity. Now a Unesco-UNDP project of three years' duration is reaching the same conclusion. The Chief Technical Adviser notes that there was a Unesco project in the same country 20 years earlier, of which no trace remains whatsoever. It is predictable, however, that the country will reach out to some other source to fill the 'gap', i.e. its thirst for foreign exchange (7). Even within a developed country, the continuing availability of outside funding can lead to a certain kind of dependence based on opportunism but with little effect on innovation. For example, Greenwood et al. report (5):

> The availability of special project funds has become an accepted fact of life within most sizable LEAs. Indeed, many medium to large districts employ a special staff or a federal program officer whose only job is to identify and apply for special state or federal funds.

Sometimes this led to genuinely creative projects which left a stamp on the local schools, but there was another equally common pattern:

> Projects generated essentially by opportunism were characterized by a lack of interest and commitment on the part of local participants—from district administrators to classroom teachers. As a result, participants were often indifferent to project activities and outcomes, and little in the way of serious change was ever attempted—or occurred.

The same pattern of 'opportunism' undoubtedly fits the posture of many developing countries after the rhetoric of educational idealism is stripped away, but it is difficult to find baldly-stated examples in the official documents which report on projects. An exception is the very personal and provocative account of a literacy centre in India supported by outside private donations (6).

Proximate inputs

Practically all technical assistance projects are now planned as *joint* endeavours between outside (remote) international or bilateral agencies and the governments concerned. Usually the idea is to provide most of the resources from the host country and to provide them in annually increasing proportions so that ultimately the project is operated, financed, and staffed entirely from indigenous sources. Performance in this regard usually falls far short of promise. For example, in the ten projects of the Experimental World Literacy Programme for which data are reported (7), only three national governments came close to spending the pledged amount (Iran, 254 per cent; Algeria, 94 per cent; Sudan, 94 per cent), whereas four spent considerably less than 50 per cent. At the same time, the international contribution was nearly always expended in full, five over 100 per cent, only two less than 80 per cent.

The largest input that is likely to be made from the proximate environment, however, is not financial but social, principally manpower. The value of this resource for the success of the project will vary tremendously, however, depending on the demands of the project for persons with various high order skills and gifts. Often, the manpower will be either volunteers or borrowed on a part-time basis from other fields (a common practice in the Experimental World Literacy Programme). Such arrangements create acute problems in long-term maintenance of the activities in question, however, since they depend so heavily on good will, enthusiasm, and co-operative spirit, intangible inputs which tend to be short-lived.

Processes in input management

All systems must establish ways of managing inputs, both remote and proximate, for defensive as well as for utilitarian reasons. On the defence side, a system without ways of coping with input can be overwhelmed, invaded, and exploited by other systems in the environment (as happened to China in the 19th century at the hands of the European imperialists, for example). Even well-intentioned inputs from remote sources can have this invasive effect. On the more constructive side, systems need to be able to use inputs in internal problem solving, filling gaps, meeting needs, building capacities, etc. At least seven input processes can be identified that a smoothly functioning system needs to have.

1. *A needs assessment* process is logically primary although not the most commonly found. In other words, a system should have ways of scanning itself internally to identify the areas where there are gaps or weaknesses which can be filled by new inputs. These identified gaps then become the shopping list for seeking out resources in the proximate and remote environments.

2. *A scanning and searching* mechanism of some kind is also required so that inputs can be acquired actively in accordance with need rather than in accordance with chance and the wishes of other systems. Less developed systems are likely to have less developed search mechanisms and strategies, particularly for reaching out to remote resources, hence the critical role of certain international agencies which specialize in information storage, retrieval and dissemination.

3. *Screening and critical evaluation* must also be focused on the input flow. Unfortunately, in the very diverse and loosely researched field of educational innovation, there are few reliable indicators of what can, what should and what should not, be allowed in. Furthermore, the criteria appropriate for innovations in developing

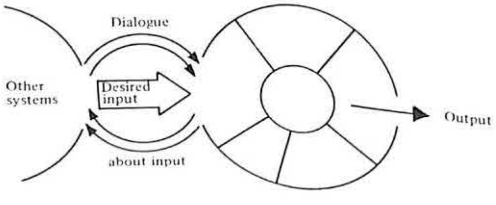
countries are likely to be rather different from those traditionally reported by experts on educational evaluation (who have worked almost exclusively in developed countries). In some areas the criteria probably should be more stringent, in other areas less so than those normally applied in richer Western nations with long-established school systems.

4. *Regulation of flow* of new inputs is necessary to avoid the 'invasion' phenomenon. Thus there has to be some consideration of how much a particular country or a particular region can take at one time. No doubt, different systems have different levels of coping with new input, but if it comes in faster than it can be absorbed there is another danger of systems becoming immune to important inputs, to be wastefully careless with what appears, in the short run, to be an abundant resource.
5. *Interpretation and analysis* constitute one of the processes also required to take raw input to the stage where it is fully internalized and in use. Inputs do not always speak for themselves. It is usually important to find out where they fit best and to decide what implications they might have for a particular need in a particular subsystem.
6. *Adaptation* is another important internalizing process, changing or reshaping external resources to fit the internal need situation. International assistance projects are usually sensitive to this need, so there is a dialogue and a number of compromise arrangements are made before a project if finally agreed upon. This is one kind of adaptation process. Sometimes, however, when international agencies are committed to some overriding international objective (such as engaging in experimental projects in functional literacy) and to certain procedures for attaining it, lack of adaptability of the input can be a severe problem (8).
7. Finally, there must be means by which inputs are absorbed into the streams of activity which constitute the regular and routine life of the host system. In other words, inputs must be co-ordinated with existing throughput processes in order to be fully utilized. Obvious as this may seem, we find that many inputs in the form of innovative projects can be taken in and maintained for their life cycle without affecting (or sometimes even impinging on) the mainstreams of the host culture. Indeed, *integration* of new inputs is probably the process in which the most serious failings occur in the innovations which we have studied.

The necessity of input dialogue

Input to a system does not usually come simply from a grey, undifferentiated expanse called the 'environment'. In fact, it almost always comes from other systems, with their own input-throughput-output processes and structures. It follows that inputs will usually have to be timed, structured and arranged to co-ordinate and match with the outputs of one or more other systems. Such co-ordination will not happen if it is left to chance. Hence there is a requirement for the system wanting to receive input to have back-and-forth communication with these other systems which have or might have outputs which are relevant. Figure 11 suggests this aspect of input.

FIGURE 11. Input dialogue.



The back-and-forth messages which surround the input transaction could be called 'negotiations' or 'feelers'. They may be initiated from either the sender system (on the left) or the receiver system. They are likely to consist of advertisements or awareness bulletins on the sender's part (e.g. 'we have some information on non-formal education projects' or 'we might be interested in supporting some type of functional literacy project for rural youth in your country') or queries and requests for information, help, or products on the receiver's part (e.g. 'we hear that you have done some work on radio study groups: can you send us any literature on that topic?' or 'we are planning a new teacher training college: is there some way in which you can help us on this?'). Such feelers are, of course, only the beginning of a series of back-and-forth questions, answers, clarifications, etc. which move either quickly or slowly toward the actual input event.

Up to a point, the more there is of this dialogue the better. In fact, it may continue after the beginning of the desired input, especially to assist in modification of the arrangements between sender and receiver, if necessary, or to solidify the relationship (connexion) between sender and receiver so that the input can be put on a more stable or mutually satisfactory basis. After a certain point, on the other hand, continuing dialogue may indicate excessive absorption in administrative detail, stalling, or reluctance for whatever reason, on one side or the other.

Because innovations in most cases can be seen as new inputs to larger systems, the quality, structuring and extent of dialogue surrounding the introduction of innovations is of crucial importance, and it is referred to repeatedly in succeeding chapters.

Structures for input management

As they become more differentiated, all systems tend to develop specialized subsystems to cope with input, to manage the various processes identified in the earlier section on processes in input management and to carry on the dialogue referred to above. These structures will vary widely in complexity, effectiveness and orientation. If the function is seen as very important, the leader of the system may take an active and personal part in examining and approving every input, perhaps also in carrying on the dialogue. In any case, there is likely to be a specialist of some sort attending to the input function as a whole, and there may be one or more specialists coping with each of the functions identified. Some education systems may feel the need for special departments for 'innovation'. Such departments will most often serve primarily as input managers or facilitators.

Openness to input

There is nothing necessarily good or bad about a system being 'open' to inputs, but systems will vary greatly on this dimension and those which are more open, i.e. allow more new ideas, products, practices, etc. to enter from the remote environment are almost by definition more innovative. On the other hand, openness is likely to come and go in cycles: no system has an infinite capacity to absorb new inputs, and having absorbed one important kind of input, a system may require a 'closed' period in which it digests this input and re-adjusts its internal functioning accordingly. Such open and closed periods may correspond to the critical periods and transition points in the growth gradient of a system discussed earlier.

Issues regarding input will return again and again as the process of innovation is explored. One entire chapter ('Resource acquisition and utilization') will be devoted chiefly to this topic, and it will be found entering again at many other places.

Throughput processes

The most complicated aspect of any theory of systems concerns what goes on *inside*. In a sense, what goes on inside is not unlike what has already been covered under 'input'. In other words, within the system there must be a continuing *flow* of ideas, people, practices, money, instructions, products, services, and so forth; each subsystem within the greater system then requires its own input and output mechanisms. But clearly there is more than this: the various parts must be orchestrated in a certain way to achieve internal balance or 'completeness'. This orchestration requires various subsystems to perform different but interdependent tasks. In biological systems this internal arrangement is fairly fixed but in social systems the configuration of elements can be changed in countless ways and is frequently altered in what are called 'structural innovations'. In spite of long-standing traditions favouring one or another internal configuration, there is little certainty regarding their relative merits. This very complex topic is introduced under the heading '*procedural configurations*' below. To some extent a procedural configuration is kept in place by a prevailing ideology or a long-standing tradition or both, but it is also likely to depend upon *leaders* who in some sense embody and personify the procedural configurations. Therefore, some comments will be made about the importance of leaders and various leadership styles in the process of innovation. Most important, procedural configurations also depend upon *structures and social infrastructures*, which are, of course, subsystems in their own right. When the desired or espoused procedural configuration does not correspond to the infrastructure in important ways, the total system is likely to be in a high state of tension or internal conflict, or both. Realization of the procedural configuration not only requires that the various members of these infrastructures be understanding, concerned, and involved in both the configuration and the goals espoused by the leadership. Hence a major issue for throughput is *participation*. Finally, consideration must be given to the special case of innovations and how they affect existing throughput patterns. Also related to this is how input affects throughput, and vice versa.

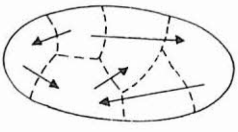
Flow within the system

The question of flow is already a familiar one. To a large extent, though not entirely, systems analysis can be the analysis of flows, and an important part of this topic has already been covered under 'input'. Yet there are many kinds of flow which ought to be considered; these are illustrated successively as they are dealt with, by simple diagrams.

(a) Permeability

At the simplest level, intrasystem flow is a question of permeability, that is, the inside of a system may be imagined as being divided up into any number of compartments, each separated from the others by a wall or membrane which prevents some things from crossing and allows others to cross, or, as described in the conclusion to the last section, which may alternately allow and not allow materials to pass. This allowance is the permeability of the intrasystem membranes and the term

FIGURE 12. Permeability is internal openness.



'permeability' may be used for specific elements or for the system as a whole. The expression 'internal openness' could also be used for the same concept.

This concept gives rise to several intriguing hypotheses. For example, it may be that young systems, rapidly growing systems, or systems in the act of creation will have very permeable internal barriers, whereas old systems, highly traditional systems, or highly structured and authoritarian systems are very low on permeability.

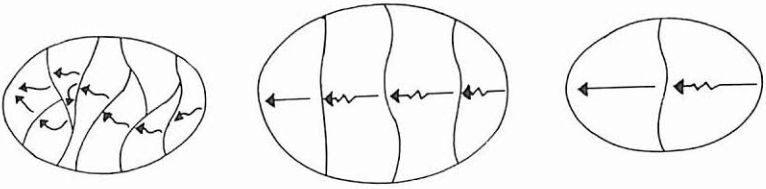
(b) Size and its effects on flow

It is obvious that flow of any sort between the regions of a very large and geographically dispersed system will be more problematic and slower than within a very compact system. However, if size is measured in population, i.e. density, the reverse may be true, at least as far as person-to-person flow is concerned. If, however, size means more elements then the conclusion would be that flow throughout the total system would be more difficult.

(c) System differentiation and integration

Differentiation inevitably means more elements, more subsystems, and more differences between elements and subsystem in respect of what they are composed of and what they separately are supposed to do. More difficulty might thus be expected with internal flow for these reasons (see Figure 13).

FIGURE 13. More differentiation signifies more internal barriers.

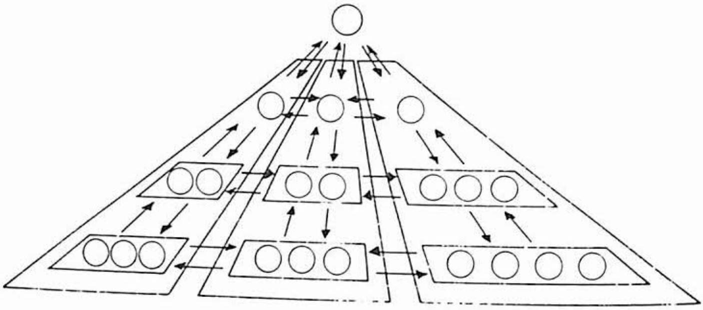


On the other hand, increased integration implies more rapid, smoother and more reliable flows between elements. Having internal elements which are well connected' is another way to define permeability.

(d) Lateral flow *vs.* vertical flow

A social system may become differentiated in at least three ways. The simplest is through a mere multiplication of elements or subsystems. This in itself creates one kind of flow problem which could be called 'lateral' or 'horizontal' flow. This could also be called the problem of 'federalism', i.e. communication among more or less equal subsystems, each of which is more or less independent, and in many ways self-sufficient. Vertical flow implies a rather different kind of differentiation, namely into statuses, levels in a hierarchy, with each level upwards having more power and fewer members among whom it is shared until finally there is at the top one person who has great power (Figure 14). Such differentiation creates special problems for the flow of information and, of course, innovation. It can be argued how much such hierarchical differentiation is good for a system. What is certain, however, is that it makes some kinds of communication very difficult. There is an illusion, strongly held in many quarters, that the task of the innovator is made much simpler if the innovator is granted power. Yet the literature contains many references to innovations which were 'mandated' but somehow never implemented or, if implemented at all, with great distortions which undermined the innovator's true objectives. In some cases it is difficult to accept complex innovations which are ordered, especially if these innovations seem to run counter to prevailing traditions or values. Acceptance is further complicated when the higher status persons speak in a different way,

FIGURE 14. Lateral *vs.* vertical: up *vs.* down.

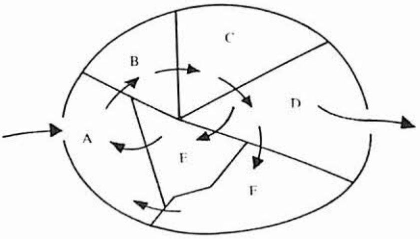


have a different educational and cultural background, etc. What makes top-down communication most difficult is the associated tendency for bottom-up communication to be difficult. Lower status persons may communicate often to those who have power over them but the messages will be distorted, especially when there is bad news to report. The people at lower levels are understandably reluctant to say anything which might reflect negatively upon themselves or their own performance. Hence, for example, when asked to report on implementation of an innovation or, even more so on the success of an innovation, they are most likely to respond positively regardless of the situation. This is a universal problem in human communication, of course, but it is especially true of bottom-up messages.

(e) Interfunctional flow

The most crucial type of flow for systems which are functionally differentiated is the flow from one function to another. As simple and as obvious as this sounds, it is rarely simple in practice. For example, every country of the world has separately differentiated subsystems and infrastructures dealing with agriculture, economic development, and education. These are separate subsystems which can never stand alone as independent entities but must feed one another. Yet countless innovative projects report problems when they try to co-ordinate programmes which fit between the responsibilities of different ministries, as is always the case in functional literacy and non-formal educational projects. Indeed, there are often severe problems of communication between colleges of education and the school systems, between primary, secondary and higher levels of education and between teachers and curriculum developers concerned with different subjects. These are all examples of interfunctional flow. Figure 15 tries to convey some aspects of the problem in a very simplified way. Superficially, it is identical with Figure 13 but it must be realized that A, B, C, etc. are units which must go together to make the whole thing work. As in a chain, each unit is now a link. No element can be subtracted and, furthermore, there

FIGURE 15. Interfunctional flow.

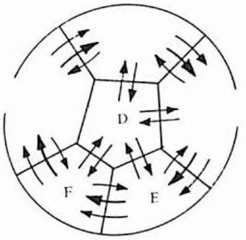


must be a flow between the elements *in a given sequence* for the whole to function properly. Secondary education cannot be given first and primary later, nor can the people wait to be fed later and be given industries now.

(f) The necessity of intra-system dialogue

The input discussion concluded on the necessity of dialogue and that theme will be repeated at various times. In view of the complexity of interfunctional flows just noted it might be asked how such flows can be either created or managed so that they happen in the right sequence, etc. The answer is, of course, through dialogue, i.e. through the same feeling out and reaching out and negotiation between senders and receivers. Once again, Figure 16 tries to depict this process in a simplified form.

FIGURE 16. Intrasystem or throughput dialogue.



Dialogue is equally applicable as the basis for creating and improving any and all of the various throughput flows identified above. In fact, a major aspect of many so-called 'organization development' or management improvement schemes involves bringing different units or different levels of an organization together and allowing and encouraging them to communicate with each other, especially about how they do and do not communicate and co-operate. These 'process' discussions reduce tensions at the interface between systems and allow them to begin a sincere exchange on a fresh basis. No doubt there is a frequent need to re-establish and refresh interpersonal, interfunctional and interstatus connexions and flows in this manner.

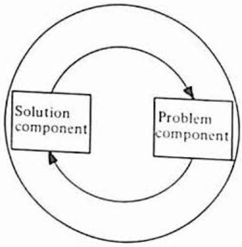
Procedural configurations

It is possible to think of throughput exclusively in terms of flow. This simplifies the analysis considerably, and many of the dynamics of social systems can be understood in these terms; yet such an approach avoids almost entirely the question of what a system is for. The introduction of the concept of system at the beginning of this chapter included reference to the need for completion as a dynamic driving force for systems and their evolution into other systems. It is now necessary to examine in more detail what these processes are which achieve equilibrium and move systems toward completeness. It seems clear that there are repeated patterns of action, sequences, arrangements among elements, either planned or unplanned, which ensure equilibrium at some level. One expression which fits fairly well is 'problem-solving' but this, as a descriptive concept covering both the actions and their consequences, may be too broad a term to start with in trying to extract only the patterns or sequences for analysis, hence the cumbersome term 'procedural configuration'.

The concept of procedural configuration was already introduced in the general discussion of systems, particularly in the discussion of 'completing' and 'creating' systems. However, since most organic, human and social systems are continuously in need of completion and are continually acquiring new elements, it is very important for them to develop routines which successfully and reliably provide those needed elements time after time. Indeed the internal elements of successful systems are organized and co-ordinated to do just this. The term 'problem solving' may also be used to describe these configurations because the missing elements can be seen as deficits, needs or problems whereas the elements which are created or acquired to complete the system are typically referred to as solutions.

At the most primitive level, therefore, the problem-solving configuration of a system will have a minimum of two steps which could be called the 'problem' step and the 'solution' step, as described in Figure 17 below.

FIGURE 17. Simplest model of a problem-solving configuration.



However the simplicity of the figure is misleading. First of all, it should be noted that the two elements are dynamically interdependent, that is, activity in one impels activity in the other. Secondly, this interdependence is circular, each element activating the other in an endless oscillation. Furthermore, these two procedural elements may in many respects correspond to functional roles and relationships, as, for example, they clearly would do if Figure 17 were to represent a family unit of a mother and a newborn baby. It could also describe the relationship between a sick person and his doctor, or any group of needy people who are turning for help to another group which has the skills, resources or willingness to help them. Nevertheless, it is also usually true among adults that the roles of 'problem' person and 'solution' person are temporary ones and that throughout our lives we are continuously switching from one role to the other. Finally, all organic systems which have reached some level of maturity and stability will contain both elements within themselves.

In the case of developing countries it is increasingly evident that a configuration which defines the 'solution' component as external is both unsatisfactory and unworkable. Developing countries are more and more turning to strategies of change which are internally complete, and in which both 'problem' and 'solution' sub-processes are internalized as much as possible.

FIGURE 18. An 'open' problem-solving system.

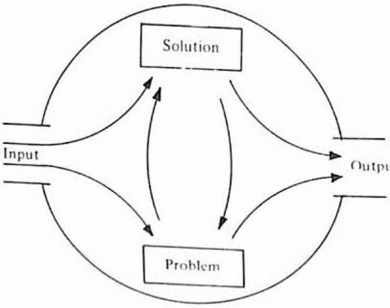


Figure 18 adds two features to Figure 17, reminding us of the fact that all systems, but particularly innovation systems, are *open*, and that this openness may impinge on any element: both the 'problem' and the 'solution' components have to deal not only with each other but with many stimuli from the larger environment (input). There is a potential overload on each element; thus, there may need to be special mechanisms set up to regulate the flow of inputs and outputs. An innovation project in a developing country might need to have one such sub-element (or office) to manage relations with the existing education system within the country or with the other existing social and political structures which are relevant and a second sub-element to deal with foreign relations, e.g. contact with various donor agencies, with projects in other countries engaged in similar innovation, and to centres engaged in research development, and production of materials as well as with other sources of expert and technical aid.

FIGURE 19. A rational 'open' problem-solving configuration.

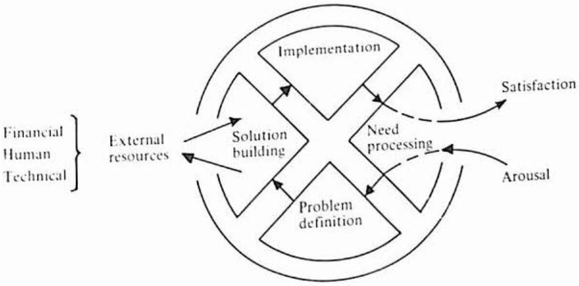
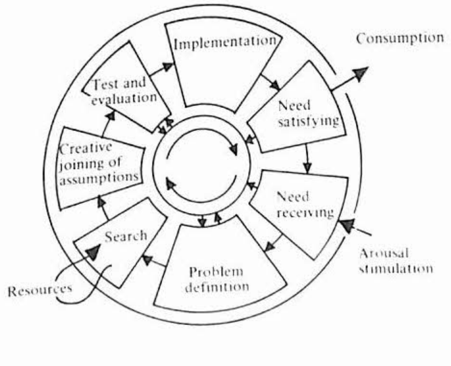


Figure 19 attempts to carry the notion of procedural configuration a little further by proposing additional internal steps which may deserve specification. It is rarely the case, for example, that a situation initially presents itself as a clearly defined problem. More typically, it occurs as inadequacy, disturbance, or distress which seems to cry out for action but in a very inarticulate way. Hence, it may be useful to separate a need-sensing function from a problem definition function. Furthermore, the creation of a solution and the implementation of the same solution are often recognized as separable elements. It is further possible, of course, to extend this elaboration in any direction. Figure 20 proposes an elaborated schema which *may* fit the actual configuration of some innovation projects. However , the point is that the procedural configurations of innovation projects are essential in understanding how

FIGURE 20. An elaborated rational configuration.



innovation works; the difference between a poorly, irrationally conceived configuration and a good one is likely to spell the difference between success and failure. We suspect that there are many alternative configurations which can be successful and we will attempt to discover and describe some of them in the course of this monograph.

It is important to recognize that problem solving configurations in human affairs are variable and that some are much more successful than others. Many developing countries want to find ways to become *independent* problem solvers, making the maximum use of internal resources, while reducing to a minimum their reliance on external resources. Therefore, an important area for innovation is the creation and testing of *new* problem solving configurations.

Perhaps the most difficult act for any innovator to perform is to *change* a procedural configuration to which he has already committed himself, even if it is obvious to himself as well as to others that it is not working. Yet an innovation activity often represents an attempt to change existing configurations, sometimes even to the point of creating entirely new ones. It remains a challenge, therefore, to design configurations which allow a stable and orderly progression from need to solution and also allow for flexibility and openness among elements. First of all, there must be an openness to allow *recycling* at any point in the sequence, e.g. if the original need changes character, if the problem definition or the project objectives alter or if new resource possibilities suddenly emerge. Even more difficult, however, is to provide for an openness which allows complete transformation into a new system, which is what must happen if genuine development is to come about. It is probable that no system configuration can be so flexible as to transform itself at any moment. Thus we should imagine that there are relatively closed periods and relatively open periods both for new inputs and for transformations. The open periods may be most likely to occur at the beginning or at the end of a problem solving cycle. Open periods may also happen at any point in the cycle where the system finds itself stuck or adrift, e.g. when search strategies fail to bring in required resources, or when a chosen solution cannot be implemented. In the earlier section on growth gradients, we introduced this concept of cycles, transitions and critical moments.

Actual, natural and planned configurations: some important distinctions

It should be noted that all systems, biological, human or social, have a configuration, usually an incredibly complex one, that is only partly understood even by the expert scientists who study them for a lifetime. Indeed, the relations among people in a functioning society, whether developed or developing, are so complex, even when they are working well, that it is impossible to imagine that they could be deliberately planned according to some man-made configuration. This realization should bring relief as well as despair, for it reminds us that many desirable outcomes will happen even without any deliberate planning. This is the underlying rationale for adopting a philosophy of total non-interference in the affairs of other peoples, a philosophy which has been gaining popularity in international circles in the last decade. It is true to a large extent that when individuals and groups are left to themselves they can find solutions for themselves and along the way they can find satisfactory system configurations to reach those solutions. Of course, if this proposition were totally true there would be no need for any sort of international assistance programmes or indeed perhaps for any international organizations whatsoever. Nevertheless, it is true enough to be a basic assumption which should be built into any planned configuration. Thus, a deliberately planned configuration is always only a *partial* configuration, relying on natural sub-configurations.

Developing countries and the experts who advise them will hold here widely differing opinions about how much detailed planning is desirable, necessary or possible.

All the countries of the world exist on the basis that some elements are deliberately planned while others are taken for granted or exist naturally. Unfortunately the state of progress in social science is not such as to indicate with certainty how or why the economy, the agriculture or the education system works.

In our search for optimal procedural configurations for problem solving it is, finally, important to steer a course between underplanning and overplanning. There is no question that the so-called 'natural process can be improved upon by planning the steps of a strategy in some detail, but a great deal of trouble can also be caused by planning in so much detail that the plan cannot be followed realistically.

Leadership

It may well be that social systems come into being and evolve as extensions or expansions of individual persons. For example, a person has an idea of what he wants to do or accomplish to fulfil a personal need, but he realizes that the additional services or help of another person are required in order to fulfil the procedural configuration which he imagines as a way to fill the need. Hence, through some means such as money, force, rational persuasion, love, deception, etc., he manages to get someone else to fit into his system. In any case there is no doubt that systems expand as a result of one kind of leadership or another and they tend to adopt or develop procedural configurations according to the aspirations and conceptions of particular individuals. Even when leaders are appointed or elected long after a system has been created and stabilized they tend to be seen as the personal embodiments and caretakers of the procedural configuration of the system as a whole; when the system works well and produces desired results, the leaders receive credit; when there are problems, the leaders are expected to make the procedural changes that would correct those problems; when the system fails to produce or perform in fulfilling the needs, the leaders are held responsible (unless they can find others to blame).

A brief quotation from Orata on the very rapid and successful grass roots development of barrio high schools in the Philippines is significant in this regard. In summing up the experience he says:

> There is a saying that, 'if there's a will, there's a way'. The experience of the barrio high schools during the last seven years has proved the correctness of this adage. The fact is that there are twenty ways or more to solve a given problem, depending upon the leadership provided which, in every single case, has been proved adequate to meet any situation ... (9).

The quotation is instructive in at least three different ways: first in suggesting that innovation depends upon problem-solving, second that athere are different *ways* (procedural configurations) for solving problems, third, that problem solving depends on leadership. There is also an implication here that leadership is a natural thing which emerges to meet a situation.

Orata has other things to say about leadership which suggest that the most effective leader is a living, visible model of the procedural configuration he wants to be realized by his followers:

> We tried, in every situation, to live by the principle that a good leader must be a good follower. There is not a single activity in which we, the leaders, acted in the capacity of overseers. When there was digging to do, we had our own shovels and used them. The leader must be willing and able to do what he asks his followers to do. He must live among them and with their problems. I stayed in the village most of the time, going to town only when I needed to work in the high school. In the same way, our Mayor, our principals and teachers and adult leaders all tried to exemplify, by what they did and the way they did it, this kind of leadership. (10)

A quotation describing ‘A comprehensive, locally initiated youth programme’ in Indonesia provides another example of the function of leadership in both establishing and animating the procedural configuration:

> The key to co-ordination among various activities, co-operation among government agencies, and the evolution of a rationale and a framework of common purpose for all the activities as far as the education program was concerned, it appears, was the energetic leadership and commitment to education of the Bupati as the chief administrator of the regency. The institutional form this spirit of co-operation and co-ordination took was known as the Body for Guidance and Development of Education (BGDE). This body was established by the Bupati by the Regency Decree No. 18 of 1969. This body is headed by the Bupati himself and is composed of personnel from all the government agencies at the Regency level which have direct or indirect roles in the educational programme. (11)

Many other examples could be cited from the literature on educational development projects of the importance attributed to leaders at all levels from the chief of state to the ministries and so forth. Usually, successful periods in a project are associated with particularly energetic and wise leaders and the most successful projects, such as ACPO, a multi-media rural education programme in Colombia, experienced a continuity of such leadership over many years (12).

Structures and infrastructures

By itself a procedural configuration is meaningless and impotent. It comes to life when people get involved: first, perhaps, a leader, as discussed above, then countless others. But leaders and followers are not enough, even when the procedural configuration is magnificent and the energy and enthusiasm of the people boundless. Structures are what keep a number of people, leaders and followers, together on a task until it is done, and they are also what allow them to repeat tasks and perform them in a consistent manner, year after year and, perhaps, century after century. Another way to express this point is to say that structures represent the institutional realization of procedural configurations. It has often been noted that the infrastructures in various sectors of national life are underdeveloped in less developed countries. This word is frequently used to mean somewhat more than we wish to imply here. Literally, infrastructure means the structure within a system (as distinct from the structures among systems). Yet, in common use, infrastructure will often include not simply the institutions but the cadres of trained persons to fit this or that role and the leadership, especially the leadership at intermediate and lower levels. Infrastructure also refers implicitly to the traditions associated with various roles and subgroups, the fact that jobs remain stable over a period of years and that performance in those jobs remains reliable. It is almost always false to say that a society lacks infrastructures because all societies contain subcultures and subsystems with longstanding traditions roles and standardized performances, e.g. with regard to childrearing and training and apprenticeship to the primary occupations. What is usually meant by a lack of infrastructure is a lack with respect to a newly proposed or decreed procedural configuration, often but not necessarily involving a new technology.

The inevitable pre-existence of various and elaborate infrastructures leads many development strategists to propose exploiting such structures wherever possible in introducing social or technical innovations. Examples are the use of traditional midwives as purveyors of family planning information, products and services, or the use of established youth groups or clubs as the institutional starting point for nonformal out-of-school educational programmes. The very successful ACPO project in Colombia for example, relied fairly heavily on the long-established religious infrastructure of rural Colombia and its prime visible role-holder, the village priest.

Innovation projects themselves depend very largely on the types of infrastructures which are established to implement the *plan* (which constitutes the expected *ad hoc* procedural configuration for the project). Again, ACPO may be cited as an outstanding example of solid project structuring:

> ACPO is administered from central headquarters in Bogotá. It has been directed since its founding by Monseñor Salcedo and has experienced continuity and stability of personnel at all levels in the organization.
>
> The institution is organized into three major divisions: cultural, administration, and radio transmission management. Backing up these three divisions are the financial office and the board of directors of ACPO. The radio division is responsible for the technical aspects of the radio network and also includes production of noneducational programming. The division of administration is concerned with the personnel of ACPO; it controls Editorial Andes, ACPO's wholly owned publishing house, a profit corporation which produces ACPO's printed materials; and is generally responsible for administrative matters pertaining to the operation of ACPO. (13)

It is important to point out that ACPO was a very large project covering a vast area. Hence there was a greater than usual need for structuring subsystems, but it should not be assumed from this example that structuring is an unmixed blessing. First of all, a project can be overstructured and overbureaucratized. It may also be that the specific structures developed or accepted fit the procedural configuration very poorly. Finally, it may be that a subsystem is created which is so successfully structured within itself that it either tends to dominate the weaker systems around it or separates off entirely, adding little to the total welfare of the larger system of which it was supposedly a part. These last two possibilities, which are referred to as 'suboptimization' by systems engineers, represent a real dilemma for innovators because they bring into question the desirability of moving too far too fast with any isolated subgroup or subsector of a country or of an education system.

A great deal more can and will be said about structures and infrastructures in succeeding chapters. Suffice it to introduce these concepts within the over-all framework of system throughput processes.

Participation as a primary throughput issue

The foregoing consideration of throughput as a function of (a) flow through elements and subsystems, (b) according to procedural configurations which are established, mediated, and controlled by (c) leaders and (d) infrastructures in some sense leaves out the most vital element from this schema, the people of the system. As indicated at the very beginning of this chapter, social systems (and innovation systems) ought to exist for people and their welfare, not the other way around. Now the insight needs to be added that the elements through which the vital flow of information, products, services and money takes place are these same people. Hence it is desirable that they recognize first of all the throughput as a whole as something of value and benefit to themselves and secondly the fact that they are involved in a procedural configuration to that end. It is an unfortunate characteristic of poorly developed systems that these conditions do not hold. Thus, individuals who are supposed to perform certain functions within the procedural configuration in fact follow much more narrowly self-interested patterns of behaviour. In a sense they act as if the larger system did not exist or existed only as an environment from which resources can be taken as required to complete or fulfil one's own more private system. At one level or another this behaviour can be called 'looting', since there is a strong analogy with those chaotic situations in the aftermath of disaster, riot and defeat, when individuals revert to total selfishness as the only remaining rational strategy. The 'looting' mentality has been noted by Bhola (14) in referring to the careless and exploitative way in which resources from developed countries were used in the Indian literacy centre referred to earlier. The same phenomenon has been observed in countless other settings, and represents the strongest argument sometimes used against external assistance projects.

These points emphasize the necessity of creating systems in which members have a strong sense of belonging and personal identification. Such a sense can be created in several ways but the surest and most satisfactory is through *participation*. It is not necessary for all members to participate actively in all aspects of decision making nor is it possible or even desirable in large systems. Nevertheless, great care needs to be exerted by leadership to involve the maximum number of people representing the most critical subsystems at certain critical periods, e.g. when a new procedural configuration is being developed or promulgated or when changes are being made in procedures, structures and, most especially, in goals.

Developing a sense of participation is especially critical in innovation projects because, as temporary systems added on to existing structures they are especially prone to the 'looting' phenomenon. Furthermore, those who perceive themselves as being excluded from participation may see the innovation and its participants as a distinct threat to their own status within the larger system. Hence, in self interest they will do all within their power to destroy the innovation, blocking access to resources, failing to respond to requests, etc. The dilemma for the innovator is that he cannot include everyone in the innovation, especially if the innovation is a pilot project or an experiment. There is therefore a need for innovators to develop various strategies for communicating with various people and groups to give them a sense of participation at some level, perhaps vicarious. The importance of these strategies in the innovation process is such as to warrant a chapter of this volume.

Technology as a primary throughput issue

There can be little argument at this point in the twentieth century that technology and its evolution have a profound effect on the shape and evolution of social institutions, and the scant reference made so far to this topic is no indication of the importance which must be attached to it. Technical systems, by themselves, constitute depersonalized systems, i.e. procedural configurations which are realized without the employment of people as elements. In some cases, technical systems represent significant savings in human labour. In other cases, e.g. airplanes, they represent achievements or outcomes that are impossible for people to attain by themselves, regardless of numbers or labour invested. However, technological systems, by themselves, have no meaning; they only begin to have meaning as they relate to individuals and as they relate to and become extensions of social systems. As various authors have pointed out (15), we live now in a world of evolving socio-technical systems in which the social affects the technical and vice versa. Unfortunately, the nature of the relationship is still very confusing. even to systems theorists, but it is clear that social systems are evolving more rapidly in the twentieth century because of the technical systems with which they are interacting. At the most elementary level, technical systems allow for much faster connexions among members of the geographically most widely dispersed social systems. They allow more members to be interconnected and they allow a much larger volume of messages to pass from one subsystem and one person to another. Technical systems also allow for the implementation of far more elaborate procedural configurations than were possible earlier. They also seem to permit the more rapid consolidation of leadership as well as the projection of the leader's image to vast populations. Most frighteningly, technical systems permit leaders to exert far more control and surveillance of separate subsystems and system members.

It is hardly surprising, given these various proven capabilities of technology, that newly created and underdeveloped systems should seize upon technology as a means of greatly accelerating system development. At the same time, various technologies, like other innovations, have the potential of destroying cultures or destroying what a people sees as most valuable in a culture. This is not simply the technology of weaponry which itself represents an enormous threat to all cultures, but also the apparently more innocent technologies of agriculture, medicine, industry and education which may tear apart cherished traditions and attitudes toward life and living which have well served a culture for centuries. Thanks to technology, we sometimes seem to be moving toward a homogenized world technical-social system at a speed which we cannot control and toward an end which we cannot clearly conceive. Small wonder, therefore, that many alarms have been sounded by intellectuals the world over against the on-rush of technology. This book, however, is not primarily conceived to add to this theme, but rather to emphasize the necessity of understanding how technology fits into social development and how it acts as an extender and accelerator of human and social systems.

Output processes

Within the logic of systems analysis it might be said that the purpose of input and throughput is output. Procedural configurations are established to satisfy certain needs and meet certain goals. The accomplishments *are* the output of the system by definition. However, any system will have many and varied outputs, intended and unintended, and it would be well to classify them in order to realize the full significance of this aspect of social systems analysis. First of all, we should make reference once again to Figure 10 and to our analysis of inputs. At that point we suggested the division of the environment into proximate and remote regions. That distinction is equally appropriate here: 'proximate output' can be used to refer to those effects which the system has on itself and its own members, while 'remote output' refers to the effects upon *other* systems, e.g. exports and outflows of material, people, services, etc. This section will have seven parts, starting with a comparison of proximate and remote outputs, followed by a consideration of other important aspects of output analysis such as goals, benefits, costs, evaluation methods, the need for dialogue concerning various outputs, and a concluding discussion of the importance of using outputs to redirect the system.

Proximate vs. *remote outputs*

Imagining for a moment the world as a system, it is clear that this system has very few significant outputs except those which are proximate. Everything which is produced is also consumed internally. Similarly, the largest nation states consume almost all of their output. The more independent a state is the more this is possible. It is also true that the primary ouputs of most political states are the security and well-being of their members, which result from adequate system performance. Moving toward smaller subsystems such as education, schools or classrooms, etc., the proximate output is less and less valued and is sometimes even viewed as incidental. What is meant by proximate output, say, with respect to a school? It includes such things as the satisfaction and well-being of the teachers, students and others who live, work, teach, learn and provide services within the school context. The achievement of a certain level of equilibrium by the school itself, the fulfilment of its procedural configuration, the solving of problems, these are also types of proximate output. On the other hand, the learning of students, the skills and understandings which they take with them into the larger society as a result of school experience: these are the *remote* outputs, and from most points of view the most significant outputs, of any school. It is furthermore quite possible for a school to perform well in providing proximate outputs without doing very well at providing remote outputs and vice versa.

Turning now to a consideration of the outputs of innovation projects, even more emphasis is found to be placed on remote outputs in most cases. A project is not so important for what it does for its members as for what it produces. In fact, the original members of a project system, especially those who come from outside the country, may be expected to go their separate ways upon completion of the work or after demonstration in the pilot' that the innovation is successful. In other words the 'system' which is set up to create support and introduce the innovation in the first place is often an intentionally temporary system (16). It comes into being to generate a specified set of remote outputs and ceases to exist after those outputs are produced; the satisfaction of its members is therefore often thought to be entirely incidental. Such a way of conceiving innovation projects has many pitfalls, however; the most important is the lack of attention paid to the reward systems and needs of individual members of the system. This lack of attention can further lead to the 'looting' behaviour mentioned earlier but it can also lead to stress, absenteeism, sickness, turnover of key staff, and so on.

The contrast of proximate versus remote outputs and their relative importance leads directly to a fundamental question raised earlier but not answered very well: what are systems for? We have said that systems are established to serve better the needs of their individual members but this, of course, is really a value position on our part and is open to argument. Almost all human and social systems simultaneously serve themeselves (proximate output) and others (remote output) and they simultaneously serve their own internal sub-systems (proximate) and the larger systems of which they are a part (which could be seen as proximate or remote depending on the point of view). At a very basic level it is possible to arrive at some sort of consensus, e.g. that all systems should support the life, health, and physical well-being of human beings and ensure their long-term survival as a species. But there is less likely to be a consensus on the well-being and long-term survival of specific types of social systems, specific procedural configurations, specific leadership groups, or specific social structures. Some are highly valued both intrinsically (proximate output) and for what they produce (remote output) while others, such as many innovation systems are viewed merely as expedient arrangements which can be altered, abandoned or destroyed if they prove inadequate on some criterion. Schools and school systems as they have traditionally existed in many countries have recently been put in the latter category by some intellectuals (18) on the grounds that they fail to provide satisfactory remote or proximate outputs, inflicting significant and permanent damage upon those they are designed to help. The same could be argued of any social institution, whether it be a classroom, a factory, an economic system, a family, a nation or even a culture, although the latter three categories tend to be viewed as sacrosanct, particularly by those who work with international agencies and multilateral assistance programmes. Once again we have approached a most fundamental topic and have not provided any answers, only posed a few more dilemmas. The main point which can be made is that both proximate and remote outputs are important, regardless of the level or scope of the system from which they emanate.

Goals and their achievement

Strictly speaking, goals are inputs and their achievement is output. The entire purpose of a system, it is often said, is to achieve certain *specified* goals, perhaps with emphasis on the word specified . Goals are typically the planned, expected or hoped-for outputs of the system, a set of focal points for the energies of system members, and a rationale for the system's primary procedural configurations. Hence they are both starting points and ending points. Goals appear to be useful in several ways: first, as a kind of organizing principle or ideology; second, as a basic set of messages to system members to inspire loyalty to the leaders. to the structure, and to the procedural configuration. i.e. as unifiers; and, finally, as measuring sticks to evalute the system's progress in achieving either proximate or remote outputs.

It is important, however, to realize the limitations of the 'goal' concept as an indicator of system output First of all, goal statements tend to be official statements of intention, sometimes issued for propaganda purposes and to disguise or obscure real intentions and aims of individuals and systems. Secondly, even when they are issued with complete honesty and good intention, they are likely to cover only a limited range of the probable output of a system, that part which is seen as most interesting important, relevant, and legitimate to the people issuing them. Many of the major outputs of systems therefore tend to be ignored in goal statements because of lack of interest or even awareness. Least of all is there likely to be a listing of negative outputs, pain, suffering, loss, damage, etc. in any set of goal statements. Hence, in making a systems analysis it is preferable to identify the outputs in terms of benefits and costs rather than goals.

Benefits

It would not be appropriate to list in this space all the items which might be viewed as 'benefits' of a system, but some sort of limited schema might be helpful. In Table 2.1 we attempt to build such a schema, recognizing its inevitable incompleteness. The table does not, for the most part distinguish between proximate and remote benefits, nor between intended and unintended. It begins at the top with the most obvious benefits and those for which there is likely to be the greatest world-wide consensus. Reading down the left column there is diminishing certainty either of what is really definable as a benefit' and what is even an 'output'. In discussing 'system' benefits we are referring only to those benefits which primarily aid the larger system to maintain and complete itself, regardless of the need fulfilment of individuals. On the other hand, all of the benefits listed for individuals could also be construed as very appropriate beneficial outputs for the larger system.

Viewing Table 2.1 now on the horizontal dimension shows the same shift from the obvious and consensual on the left to the more obscure and debatable on the right. 'Products' and 'services' at the level of personal life needs should create no problem of understanding or disagreement. However. we propose that, to provide for these basic products and services a system must also generate outputs in the form of structures, procedural configurations and leaders to match each of the basic need areas. In effect. what we are saying is that each need area requires its own sub-system for fulfilment. Similarly, a society requires education for each of the basic need areas; and this education must be of at least two types: (a) general education for all the members of the system so that they can be effective consumers, and (b) specialized education in the various skill areas implied (e.g. for food, the various aspects of agricultural occupations, not to mention the various occupation of food processing and distribution). We could also have listed education on the vertical axis as one of the self-fulfilment needs of individuals and as one of the needs of larger social systems, but since we are always asking the question, 'education for what?' and since the 'what' seemed to fit pretty well the listing which we already had on the left hand column. this seemed to be a satisfactory and rather inclusive way to cover the topic. Finally, at the far right end of Table 2.1 we include what might be an emergent set of outputs still only dimly recognized as valuable by most societies, namely the adaptive and creative capacities of people and systems in each of the need areas mentioned. Such capacities may not be clearly seen as outputs in the normal sense of the word

TABLE 2.1: A framework for analysis of system outputs as benefits

	Need areas	Products	Services	Support and control structures and procedural configurations	Education for: (skills, understanding)	Capacity to grow, innovate, improve or develop
PERSONAL LIFE NEEDS (examples)	Food Health Shelter Clothing Security Living space Procreation	→↓ →↓ →↓	→ ↓ → →	→ ↓ → →	→ ↓ → →	→ ↓ → →↓
PERSONAL FULFILMENT NEEDS (examples)	Sexuality Affiliation Achievement Aesthetic Intellectual Recreation Work Social support Community Spiritual Free choice	→↓ →↓ →↓ →↓	→ ↓ →↓ → ↓ →↓	→ ↓ →↓ → ↓ →↓	→ ↓ →↓ → ↓ →↓	→ ↓ →↓ → ↓ →↓
SYSTEM SURVIVAL AND FULFILMENT NEEDS (examples)	Exports (to earn foreign credits) Connexion Cohesion Administration Procedural configurations Structures Leaders	→↓ →↓ →↓ →↓	→ ↓ →↓ → ↓ →↓	→ ↓ →↓ → ↓ →↓	→ ↓ →↓ → ↓ →↓	→ ↓ →↓ → ↓ →↓

since they describe a characteristic or quality of a system. However, when a society reaches the point where it has such a quality, it could be said to have made a significant *achievement*, hence an output.

Perhaps the most important lesson to be learned from Table 2.1 is an appreciation of the variety and complexity of possible outputs of a system. Another point which it raises is the connexion and interdependence of different outputs and the relationship between educational outputs and all others. Education is an important output because it is a vital input in the creation and development of each of these various subsystems serving different needs and, most especially, a vital input in the building and completion of the national state system.

From this analysis, there emerges a further lesson that a system's outputs become vital inputs for the maintenance, growth and further development of the system itself. At the simplest level, a steady and expanding stream of experts to other countries earns foreign credits which can be exchanged for vital inputs which cannot be generated or located within the proximate environment.

Costs

In most respects, costs can be viewed as simply the inverse of benefits. Hence, working from Table 2.1, each square can be seen as a 'benefit' if there is a gain or an increase or an improvement of some sort, and as a 'cost' if there is a loss, decline, decrease or deterioration. However. this simple formula works better for some categories than others. It is rather difficult, for example, to think in terms of educational costs as a lessening or lowering of skills and understanding in this or that area, although this sometimes happens. Costs are more typically calculated in terms of specific resources human and material, which are expended, rather than in terms of needs which are not met.

The question of cost analysis is made slightly more complex by considering whether costs are 'outputs' or 'inputs'. In many respects they can be viewed simultaneously as both, since they represent the energy, money and human and material resources which have to be expended to make the system work; hence, the investment is an input, while the resulting loss or deficit is the output. Obviously, such a formulation is not completely satisfying.

It is furthermore not always clear whether a given output or effect of system action is a cost or a benefit. For example, a school building project which (a) requires a community to expend its energies in co-operation, which (b) requires it to use up local resources of wood, clay and metal, which (c) requires it to trade some of its excess harvest for other building materials or the employment of a teacher, has accumulated quite a list of costs which would appear to be very beneficial at the same time, both to the community itself and to the larger system.

The way in which costs of innovation projects are most frequently analysed is in financial terms. There are certain advantages to such an approach in that it then becomes possible to both add and compare costs for different aspects of a project, different ways of implementing projects to achieve the same goals, and different projects. We need to emphasize, however, that the range of important costs of a project is very very wide, again as suggested by Table 2.1, and very few of these important costs are realistically amenable to even the crudest monetary estimates.

Evaluation of outputs

Discussion of benefits and costs has so far only skirted the issue of evaluation. Once again, reference to Table 2.1 will readily show the difficulty of measuring in any summative and precise way all of the benefits and the costs of a system's total output. Therefore, evaluation first appears to require a narrowing of perspective based on some decisions as to what is really important in a particular instance and what is not. We have already pointed to the fact that it may be very misleading to evaluate a system's output in terms of previously specified goals. Nevertheless, such goal statements if they exist at all, may be a useful starting point. What else is added to the list depends in no small measure on the evaluator's own values or the values of the people who ask for the evaluation. The latter are not necessarily members of the system; especially in the case of international assistance projects, the people who have an interest in the results are the outside agencies which have donated certain vital inputs in the form of expertise, material and foreign exchange. In this case, it might be asked *whose* values are represented in the evaluation and whose values ought to be represented . It might then be argued that a donor agency has a right to know whether or not its contribution has had a desirable impact; does it also have the right to define what is desirable? Increasingly in recent years this right has been challenged. On the other hand, it is arguable that there are *some* values which are more or less universal, such as those at the top of Table 2.1, i.e. those related to human life itself and the survival of the species. If there are such values, then it seems to follow logically that any project, regardless of its stated goals, which manages to have positive effects in these basic areas can be judged worthwhile.

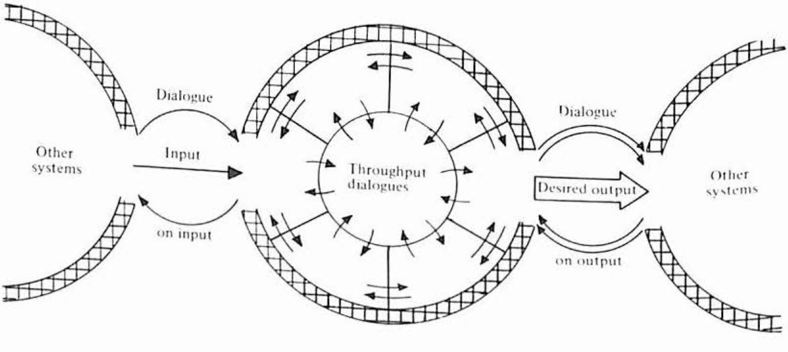
One of the worst pitfalls of evaluation is to base it solely on the dimensions which are most easily measurable. This, we believe, is one of the dangers of analysis in economic terms. The prior question must always be 'what is important?' not 'what can be counted?' or 'what can be documented clearly?', 'what can be measured precisely?' or what can be established beyond the shadow of a doubt?' This means in many cases being satisfied with crude estimates or guesses which cannot be added together meaningfully, which cannot necessarily be compared, and which cannot be verified from independent sources. Looking at some of the items in Table 2.1, some of the problems can be seen immediately. It may well be that a society puts a very high value on freedom of choice; certainly there are references to 'liberty' in the statements of goals of many countries, but what measures can be used to evaluate output on this dimension? It is not impossible to make such an assessment, but it is not simple and the results are not likely to receive unanimous endorsement. Even more complicated would be assessment in such areas as the aesthetic, the community or the spiritual. At the level of system fulfilment, e.g. whether the society had developed a satisfactory procedural configuration for solving various problems, the measurement problem is again extremely complex. Under these circumstances, it is not surprising that formal evaluation procedures emphasizing quantitative measurements and statistical tests are looked upon with doubt and some apprehension by the people being evaluated.

Evaluation is of great and increasing importance as a part of the system development process, and especially in the case of innovation projects. The above remarks are presented not to discourage such efforts but to urge an appreciation of the complexity of the task. Evaluation of system outputs is still largely an art, not a science, but it is rapidly evolving in the latter direction. Even at this early stage, caution is called for in interpretation but efforts to count, measure and quantify in every sector should not be denigrated. In the abstract, we can readily agree that there are three fundamental questions: 'how much?' 'for how many?' and 'for how long?'. Answers must be found to these questions regarding benefits and costs across the entire range of important system outputs.

The necessity of output dialogue

What was said earlier about the necessity of input dialogue applies equally to output. Both the remote and the proximate outputs become important inputs to other systems of various sizes and types. These other systems need to be oriented to receiving such

FIGURE 21. Output dialogue.



outputs in the form and at the time they are delivered. To develop and maintain such sender-receiver relationships requires a back-and-forth discussion, request-answer, awareness building, clarification, negotiation. Figure 21 tries to depict this output dialogue in relation to the other types of dialogue discussed earlier. The 'other systems to which both input dialogue and output dialogue are directed could be the same system as would be the case in any bilateral trade agreement, for example.

For an education system, output dialogue is a fundamental problem which is rarely handled well. Since the primary output of schools is people with various kinds of skills and understandings and since such outputs are intended to supply skilled manpower to other systems such as agriculture, medicine, industry, etc., school systems should be in continuous dialogue with these other systems so that they can determine where people can be placed, where there are shortages, where there are problems which call for a response from the educational sector. Ultimately, the value of an education system must be judged not on the basis of its output but on the use which can be made of that output by these other systems. Hence, a system which turns out a large number of basic research scientists or classical scholars may be failing totally in a fundamental sense if there are no needs for such skills in the society and if there are other vital areas of the national system which cry out for more skilled manpower.

These remarks apply with even greater force to innovative projects. The most important output of an innovation project is the innovation, itself. It is supposed to be an example or a model to be followed, to be continued, to be expanded, or to be diffused throughout the country if it is successful. But many innovations have little long-term impact even when they are successful because there has been little dialogue with potential users, implementors, decision makers and others in the larger education system. Such people are not fully aware of the innovation, its potential value, how it might fit in to the rest of their system, etc. Hence the long-term failure of many innovations may be as much a result of poor input dialogue as it is the result of inadequacies or failure of the innovation itself.

Using outputs to renew and redirect the system

There is a growing realization that effective systems monitor their outputs carefully so that they can use such information to improve themselves, altering structures, procedural configurations, changing inputs, adding or removing elements, all so that the system will work better produce more benefits at less cost. Such is the most important rationale for any type of output assessment or evaluation. It is therefore rather distressing to find so few reports of innovative projects where the evaluation was either well executed or taken seriously.

The various case studies of nonformal education reported by Ahmed and Coombs provide some good illustrative material on these points, and their comments on evaluation efforts and their use are generally distressing. For example, in the Jamaican case.

> The effectiveness of the YDA program to 1972 is impossible to quantify. One group of objectives clusters around the personal development of the camper. These include good character development, the development of leadership qualities, a sense of civic and community responsibility, self-discipline, and attitudes to facilitate their continuing intellectual and technical development. No studies exist on the progress of campers as they left, nor was the stage of development of individual campers known before joining. (18)

The problem is most acute for large projects which are locally generated and receive minimal external assistance in terms of either financing or technical expertise. From the same source comes the following comment on the very interesting and *probably* quite successful Indonesian project

> Like most educational programs, particularly those that are locally initiated and operated on shoestring resources, Jombang has not been very conscious about the importance of systematic evaluation of its activities and maintenance of records on what happens to its clientele. However, its major achievements, problems, and significance are probably sufficiently visible. (19)

As an example on the positive side, reference can again be made to the ACPO in Colombia:

> A program as complex and extensive as ACPO's requires considerable feedback to gauge whether its objectives are being realized.
>
> Through a system of statistical reporting, examinations, correspondence, and special research projects ACPO has tried to monitor results and, in turn, adjust programs to meet the needs and interests of the target audience. However because this audience is remote and widely dispersed, the monitoring of results has been extremely difficult. (20)

However. the authors of the ACPO case study make it clear that, even here, attention to feedback is less than optimal in practice.

> Mass media educational programs require effective feedback mechanisms to ensure that the right messages are being broadcast, that they are being accurately perceived, that a loyal listening audience is being built up, and that the learning offered is put into practice. ACPO has successfully used correspondence as a feedback mechanism in order to adjust its program content. In general, however, it has not effectively monitored its program and cannot accurately gauge its impact in rural areas. Full use has not been made of local personnel as a potentially rich feedback channel. (22)

Use of output as a means of redirecting the system is probably one of the most important conditions for system improvement, growth, and evolution. However, adequate system monitoring is not possible if the members and the leaders of the system have no clear understanding of themselves *as a system*, if they are unaware of their own internal connexions and procedural configurations, if they have not accounted for their inputs, both proximate and remote, and if they have not thought through in a serious way what their outputs *should* be. Hence this consideration of feedback is an appropriate note on which to bring to a close this analysis of systems and their development

SUMMARY AND CONCLUSIONS

By way of summary and as a lead-in to the more detailed and empirical chapters which follow we would like to set forth a number of propositions not about systems as they are but about systems *as they ought to be*. Each of these propositions is, therefore, on the one hand, a hypothesis which we would like to test with the empirical material and, on the other hand, a tentative recommendation for would-be innovators and would-be system builders and developers. Below, we will merely recapitulate in telegraphic form what has been said earlier to serve as a guide to our subsequent presentation. In the concluding chapter we will return to reconsider these propositions in the light of the findings

What is an optimal system?

An optimal system is very extensively and intensively *interconnected*, allowing the free and rapid flow of information, services and materials among all its vital subsystems.
An optimal system is highly *cohesive* creating in its membership a strong sense of common purpose, interdependence, and shared identity.
An optimal system is continuously and actively attentive to the on-going and emerging *needs* of its members.
An optimal system maximizes the utilization of relevant resource *inputs*, both from the proximate and the remote environments.
An optimal system has the capacity and the desire to carry on *dialogue* with other systems regarding inputs and outputs and among its own members.
An optimal system abides by procedural configurations which allow for continuous and effective *problem solving.*
An optimal system can rank and monitor its most important outputs and use such information for reorientation of both goals and means.
An optimal system is *open* to redirection of goals and means, based on an accurate sensing of a changing environment and of barriers encountered in problem solving efforts.

In addition to these general proposals regarding all types of systems, and most certainly education systems there are some additional propositions which have more specific application to innovative subsystems and innovation projects.

What (additionally) is an optimal strategy for system changing and innovation?

It is well-*connected* to the system which it is attempting to improve, having effective connexions and relationships with key persons and opinion leaders in all relevant subsystems.
Persons involved in the innovation subsystem work together as a *cohesive* team with a shared high sense of interdependence and committment to project objectives.
It is oriented to serving the real and self-perceived *needs* of the system it is trying to change (the 'host' system).
It is *open* to recycling and to trying to improve its own procedural configurations for problem solving.
It engages in continuing and active *dialogue* with the host system regarding throughput and output, with a view toward the subsequent acceptance, integration, maintenance, and diffusion of the innovation within the host system.
It works to improve the problem solving configurations, leadership and structures of the host system.
It tries to help the host system move toward higher levels of development as defined by the host system.

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CHAPTER THREE

Project patterns in reality

In order to clarify their pertinence, it is necessary to apply the concepts and model outlined in the previous chapter to a cross-section of innovative projects. In following the chronology of a given project and the interacting factors which contribute to its success or failure, it should be possible to isolate some of the recurrent patterns and so to determine (a) whether these patterns can be explained satisfactorily by the model and (b) whether those projects having the properties of an 'optimal system' as defined earlier are, in fact, the most successful.

There are, however, limitations to this exercise which have to be borne in mind when testing our theory against the empirical evidence we have compiled. The model itself is descriptive and exploratory. Much of the empirical evidence is incomplete and it comes from multiple sources whose reliability cannot be fully ascertained. While it is possible at this stage to present an overview of the innovation process in developing countries and of the factors which appear to influence it in specific ways, we are still far from being able to elaborate a comprehensive theoretical model which can account for all the components and their interactions.

CHANGE AND THE FUNCTIONING OF SYSTEMS

To begin at the most general level, there seems to be a basic dynamism at work in many projects. There is a strong desire – often after independence – for major change, which is often manifest in the form of large-scale projects. To use the concept developed in chapter II, we have a 'major system transformation', whereby a large number of new persons, resources and connexions are added to or redistributed within the education system in a relatively short period of time. Things begin to happen very quickly, on a major scale and in ways or with groups of people with which ministry officials, teachers, students or village leaders have little or no prior experience.

There thus arises an unusual situation where the political system is being less well shielded from outside influences. In most cases, political leadership is an intersection of conflicting pressures from different interest groups, so that the margin for radical change is reduced by the fact that any major change will involve an unacceptable loss of power or privilege on the part of one of these interest groups. Our data suggest, however, that in a number of developing countries the political situation *is* unusual and that therefore demands for radical change in education are not only voiced but also acted upon. Although outside the scope of this study, there are a number of possible explanations for this phenomenon:

- the demands, after independence, to create *radically* different programmes and institutions which are less dependent on colonial influences;
- the urgency of attaining economic self-sufficiency, which simultaneously entails massive changes in the school curriculum and rapid development of the out-of-school training network;
- political and economic pressures from within the geographical region;

- the presence, in some countries, of a relatively small élite which maintains its authority over a large population and is thereby able to implement radical changes which need not be diluted through political negotiation and compromise;
- rapid changes in political leadership in some countries, with the accompanying tendency to move from one doctrinal pole to the other, with each programme being felt immediately in the schools;
- a conscious divorce of rhetoric and follow-through, i.e., the necessity on the political level to call for and initiate ambitious changes in the education and training system, with the near certainty that the administrative and technical infrastructure, along with local customs, will reduce the margin of actual change to the point where few schools, teachers or administrators are obliged to function in radically novel roles or structures for more than a few months;
- the availability of outside funds and expertise from bilateral or multilateral sources on such a scale that radical changes *can* be conceived and introduced.

Along with this strong desire for change and thus willingness to act, however, is the fact that changes must be carried out in administrative and technical structures which were not designed to cope with projects of such a magnitude. The 'procedural configurations', as defined and described in chapter II, are neither developed nor reliable enough to service so many and such different demands. As a result, these demands are held up or transformed in such a way as to be more compatible with the existing rules, norms and routines. In so doing, the infrastructure is acting to reduce drastically the rate and magnitude of change which had been the principal goals of the poject. There is then a process of *reversion* whereby the technical and administrative infrastructure protects and preserves itself by reducing the number and variety of new components in a project until they resemble the usual demands and can be serviced in the customary way. By this process, for example, an innovative rural education project tends to get smaller and more like the primary schools it was meant to replace as the project moves from the planning phase to the network of experimental schools. New types of out-of-school entrepreneurial training programmes come to resemble the conventional in-school curriculum or the traditional apprenticeship schemes.

In this way the administrative system functions very much like a personality system to reduce the threat of an overload of novelty. It avoids being obliged to behave in ways with which it has too little experience, too little certainty that it can cope successfully without being harmed. Cultural and social systems operate in a similar way; their influence on innovative projects is analysed later in this chapter and in chapter V. The basic point, however, is that personality, social, cultural and political systems do not generally—except in extreme situations—give themselves goals which would lead them far beyond their original structures. In this sense, organic change is not different from planned change; both are essentially conservative, in that their primary function is to integrate the unfamiliar into the familiar, to graft the new on to the old.

We have then a basic pattern which characterizes many but by no means all of the projects examined in this study. It appears to fit innovations introduced at the national level more closely than local projects, and it is associated more often with innovations aided through a technical assistance programme than with wholly 'self-help' projects. This pattern is described succinctly in an interview with a technical adviser for a series of Latin American projects:

> The projects I have worked on can't be ambitious enough for the needs of the country, but they are often too ambitious for the actual possibilities (of carrying them out).

Similarly, in response to the survey question, 'In your opinion, were the official objectives of the project realistic?', 59 per cent of the national and international experts considered the objectives of their own projects to be 'very' or 'extremely' ambitious. Below is a rudimentary schema of this pattern.

TABLE 3.1. A 'problematic' pattern of implementation and outcomes of innovative projects.

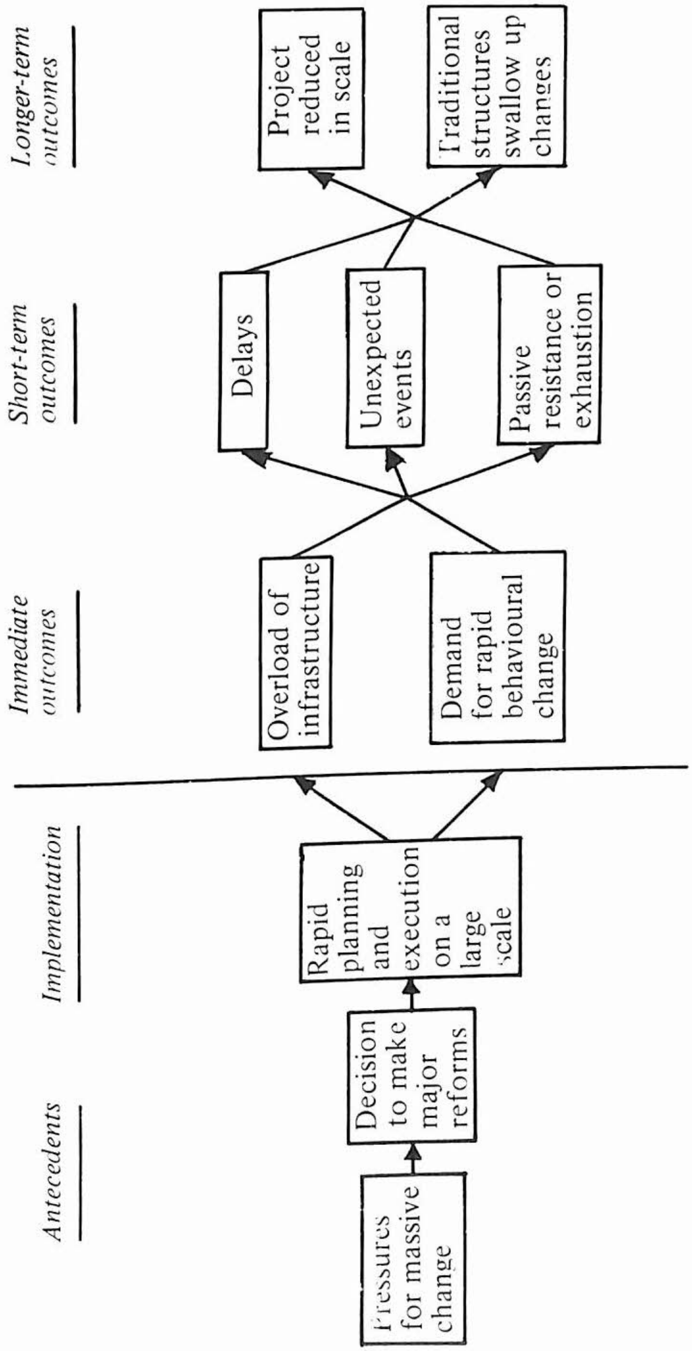
Antecedents
Implementation
Immediate outcomes
Short-term outcomes
Longer-term outcomes
Pressures for massive change
Decision to make major reforms
Rapid planning and execution on a large scale
Overload of infrastructure
Demand for rapid behavioural change
Delays
Unexpected events
Passive resistance or exhaustion
Project reduced in scale
Traditional structures swallow up changes

FIGURE 22. A 'problematic' pattern of implementation and outcomes of innovative projects.

Comparisons between developing and developed countries

We do not have comparative data from a cross-section of innovative projects in highly industrialized countries, but we believe that there is a clear relationship between the magnitude of the innovation and the procedural structures available for its implementation in such countries. The needs are no less urgent and the desire to create new programmes to meet them is no less strong. Rather, the difference lies in (a) the existence of a more stable, more highly differentiated infrastructure (of people, roles and routines) which can efficiently service large-scale projects; (b)the existence of a minimal control mechanism for weighing the relative costs and benefits of a proposed innovation, so that the capacity of the institution or administration to carry out the project is evaluated at the outset; (c) the ability to marshal a sizeable amount of funds and expertise at critical moments and, finally, (d) the likelihood of having some prior experience with the innovation—in the form of similar projects undertaken, the presence of an ongoing pilot project or of people at hand who have worked elsewhere on projects of the same nature—so that with a knowledge of what to expect it is possible to reduce some of the difficulties to come. Put succinctly, this means that in highly industrialized countries educators might be less likely to take on innovations which they are not fairly certain of implementing successfully, i.e. they might be less likely to take major risks. They are likely to devote more effort and to have more refined and reliable tools with which to make that calculation or, in the case of misjudgement, to bail out the project before a state of crisis is reached.

In some instances, these mechanisms and resources can be a handicap. By reducing the margin of risk, they screen out some very ambitious innovations which might solve a major educational problem. It is likely that some of the successful large-scale literacy and apprenticeship projects in Algeria, Sudan, Tanzania or China would never have been undertaken in European or North American countries on the basis of a rational calculation of the amount and quality of resources needed to implement them.

However, for the most part, these risk-reducing tools do allow administrators to channel the available energies and resources in large-scale innovations in the manner least likely to expend them too quickly or to spread them uneconomically over the life of the project. In fact, these two problems (premature exhaustion and uneconomic distribution of resources) are principal features of many of the projects we have studied. This is particularly true for large-scale or ambitious innovations—as measured by the numbers of persons concerned, the budget of the project or the degree of change sought in the behaviour of the people affected by the innovation—and that as we shall see, the fact that these mechanisms and resource exist in highly industrialized countries does not mean either (a) that they are consistently used or (b) that they are being used to implement a project which responds to a real need.

Options in the case of insufficient or unreliable procedures

In those countries where educators are aware that the procedures for planning and carrying out a project may be unreliable or insufficient to achieve the project's goals, a number of choices are made. The most obvious choice—to reduce the size and ambition of the project—is made less often than expected, even in projects planned with the advice of outside technical advisers. Another option is to go ahead and implement the project, relying heavily on the energy and committment of the educational and political leaders involved. In such cases, the innovation is carried out in response to a generally felt need or problem, e.g. massive shortages of trained teachers, high drop-out rates, illiteracy, unemployment of untrained youth in the cities, etc. The evidence from the survey, literature review, interviews and analyses of project evaluation reports suggests that these projects run into serious trouble after the initial phase of implementation, unless such a 'crusade' approach can be maintained at both the political and local levels.

A third option puts an emphasis on massive outside aid (loans, grants, expertise, materials and equipment). This strategy appears to create as many problems as it solves. The aid is injected into a decision making, administrative and technical infrastructure and cannot be absorbed. Thus, in conformity with the principle of system overload, the many inputs so rapidly infused are wasted or 'looted', short-circuiting the system's own problem- solving cycles. On the other hand, there are some positive alternatives in the timing and distribution of external aid; these are discussed in chapters IV and VI. A fourth option, similar in its effects to the third, is that of taking resources and trained people from one sector and placing them in a project of higher priority. It is worth mentioning here that, paradoxically, the relative efficiency of smaller-scale or local innovations is often *enhanced* by constraints: the absence of consistent, high-level administrative support, inadequacy of funds and materials, and necessity of appeasing groups with conflicting interests, leave innovators with the only remaining option, *viz.* lower their ambitions to a more realistic or less risky, (i.e. less unpredictable) level.

THE IAC MODEL

At a global level, then, these two variables, the relationship between the scale or ambition of the project and the state of cohesion and connexion in the procedural configuration on the one hand, and on the other the type of implementation which is decided on, determine the outcomes of the innovations studied in this book. Some of the other key variables are discussed below and the principal patterns resulting from the interactions between all these factors are presented at the end of this chapter and in chapters V, VIII and IX.

First, however, it will be useful to consider some examples of large-scale and small-scale innovations, to see under which conditions these changes can be effected and to analyse what is likely to happen when some or all of the necessary conditions are absent. This may be done by using a simple, common-sense model. To begin, as mentioned earlier, developing countries have a strong and urgent desire to carry out radical changes in their education and training systems. Schematically, this comes about because either the system is functioning poorly in its present state, or the present system does not correspond to the new goals set for it. The purpose in making radical changes is to achieve major results quickly. The more teachers trained, the more vocationally oriented rural schools opened, the more functional literacy projects started, then the greater the chances that the country will be able to reform *rapidly* its in-school and out-of-school networks to meet its present or future needs. Like any wager with large stakes, this is a high-risk strategy with potentially large rewards. But there is also the risk of failure with an attendant wastage of scarce resources, bitterness and disappointment at the local level and a good chance of political mortality at the ministerial level.

An analysis of the case study literature, survey responses and interviews indicates that even the most radical changes are not radical enough for the needs. For example, Prosser remarks in his evaluation of the ambitious and costly youth camp system for nonformal education in Jamaica that the camps could only service 2 per cent of the illiterate and unemployed in the eligible age group of 15-16 years (1). Lallez, in his analysis of the IPAR project in Cameroon, notes that a pilot project was ruled out because such projects typically take too long to implement, evaluate and generalize (2). In the interviews, both technical advisers and national experts frequently mention that a pilot project was rejected for this reason. This sense of urgency, deriving from a situation of 'structural lag', results in the perception of a crisis, which prompts political and educational leaders to initiate reforms on a major scale, without passing through an experimental or pilot phase. However, in order to achieve major results quickly, an education system needs smooth planning and administrative machinery, optimal political conditions and, often, major resources in the form of trained personnel and equipment. Without all or most of these components, which are examined briefly in the following paragraphs, the risk of failure becomes much greater than the probability of success.

Infrastructure (I)

As this term is more familiar than 'procedural configuration', it is used here as a synonym, although, as shown in chapter II, infrastructure is a more restrictive term. The reference here is to the efficiency of the entire problem-solving mechanism, the manner in which the system processes its needs, defines the problem in operational terms, elaborates solutions for the problem and, in particular, implements those solutions. A good infrastructure (I+) implies four components: (a) correct definition of needs (e.g. more pupils with basic skills in literacy and numeracy are required for the local and national economy); (b) correct analysis of the problem (e.g. there is a high drop-out rate, due, at least in part, to the lack of trained teachers to teach these skills and a curriculum which does not apply these skills to practical problems); (c) the solution is appropriate and materially possible (e.g. create a curriculum development unit, a publishing service for the mass production of new materials, a retraining programme for teachers, a new recruitment and training scheme for pre-service teachers, etc.; and secure the funds, equipment and personnel); (d) the implementation is rapid and reliable (e.g. authorizations are given in time to organize meetings, purchases and new building projects; materials arrive on time and in sufficient numbers; people have clear instructions or, if not, a rapid means to getting them). The last component is particularly crucial, not only because it determines whether and how the innovation will be carried out, but also because it oversees the regular functioning of the educational system, i.e., other innovative projects and all the stable ongoing programmes.

Authority (A)

This is the first element of what we called 'optimal political conditions'. In a more complex model, we would distinguish between 'authority', 'power', 'control' and 'leadership', but here we have grouped them into one component which gives energy and direction to the problem-solving cycle. High Authority (A+) in this model means that there are people—not always the same—who are making certain that a need is recognized, the problem treated, some solution found and that there is follow-through in the course of implementation. Here again, we shall focus on the last dimension: the importance of a mechanism of control or leadership which is itself *stable and reliable* and which can ensure that people will perform in conformity with the plan on which the innovation is based.

Consensus (C)

This is the second part of 'optimal political conditions'. It means simply that people involved in a large-scale innovation (as administrators or as the public for whom the project is intended) agree with its objectives and with the way it is being carried out. The evidence in this study indicates that it is very difficult to achieve consensus at the outset and, when achieved, to maintain it. In a large-scale project stemming from what is perceived as an urgent need, it is not usually possible, politically or administratively, to wait until agreement is confirmed. Typically, one *assumes* consensus and implements. Even if there is consensus at the outset, it will tend to dissolve over long periods or after intensive amounts of instability, novelty and uncertainty. The innovation 'system' requires a minimum of order, routine and predictability to maintain its 'integrity' or identity, and this minimum is almost always underestimated by administrators. Here, in fact, lies one of the principal dangers in the management of innovation, the fact that one group of persons (administrators, political leaders, teacher-trainers, experts and advisers) is determining the amount and intensity of change with *another* group (village inhabitants, teachers, students, administrative staff, etc.) is to undergo.

As a corollary, it is also difficult to have *both* a high degree of consensus (C+) and of authority (A+). That is, people do not consent easily or for long to having the control of their affairs in the hands of someone else, and projects where the authority is diffused among all the parties involved are very rare and generally too slow-moving to avoid discontent and conflict.

Resources (R)

The model would be incomplete without this component, by which we refer to a large number of highly trained personnel and a good technical and communications infrastructure, as well as available capital for providing more of both. However, we have chosen to leave it out of this model, both in order to make the model more readily comprehensible and because practically all developing countries are handicapped by insufficient resources. Even those countries with high reserves of capital (e.g. some of the Arab States and Latin American countries) lack trained personnel and technical infrastructure. There is probably a high correlation between these last two components and the efficiency or reliability of the infrastructure in a given country at the national or ministerial level—this being another 'formal' distinction we might make between developing and highly industrialized countries—but this lies, again, outside the scope of our study.

Let us look now at some of the combinations to be found of these three main components.

COMBINATIONS OF THE MODEL

I+ A+ C+

In our model, the quest for major change is likely to lead to successful implementation when there is a good infrastructure for problem solving, high authority and high consensus (I+ A+ C+). That is, a project is likely to be well-conceived (a viable solution to the problem, an appropriate response to a felt need) and well executed (attaining its initial objectives in the time and manner foreseen). The country or institution is able to make a major reform quickly without weakening its capacity either to make other reforms or simply to keep the rest of the education system functioning normally.

The problem of I –

When, on the contrary, there is a weak infrastructure (I –), the entire problem-solving cycle becomes unreliable. As a result, there are 'errors'. The more ambitious the project and the weaker the infrastructure, the greater the likely number of errors, that is, the more likely a great number of *unpredictable* things will happen in the life of the project. This, in turn, reduces the probability that the final form of the innovation will resemble its original design. In other words, very ambitious innovations fed into underdeveloped or unreliable infrastructures are likely to have a lot of unanticipated outcomes, most of them unpleasant. As we saw earlier, the 'natural' or adaptive functioning of the administrative system will impel it to slow down or reduce the scale of the project, thereby limiting the gravity of the problems encountered in implementation (but also condemning the innovation itself). This pattern corresponds to several projects analysed later in this chapter and in chapter V. However, in some cases, the project is so vast, its political importance so great, the resources from inside and outside the country invested in it so considerable, that it cannot be slowed down, at least in the initial phase. Such innovations tend to lurch from crisis to crisis and to end up as large-scale 'pilot projects' with little prospect of being generalized as long as they are propped up by special resources and unusual administrative support. Unfortunately, once these props are taken away, the project is assimilated into the ongoing educational and training network on which it has very little long-term impact.

The weakness in the infrastructure can manifest itself at various points in the problem-solving cycle:

- in the diagnosis of the need for change, where genuine needs are not sensed or are distorted by the time they reach the planning and decision making units;
- in the definition of the problem, where the baseline data are unreliable or where the educational leadership has fixed ideas and tends not to consult the evidence from the field;
- in the solution proposed, which may be inappropriate or impracticable;
- in the implementation phase, where the performances of the people involved in the project, the administrative support and technical machinery are not reliable, i.e. do not provide needed elements in the form needed.

Perhaps the best way to concretize this part of the model is to look at some of the typical barriers encountered in innovative projects. A full list is included in the original questionnaire (see Annex 1); a breakdown and analysis of the principal clusters derived from the survey responses is given in chapter VIII. If we make a more qualitative analysis of these barriers—by isolating those which appear with moderate frequency and at least a moderate degree of gravity in all four sources—we come up with the following list:

- long distance between places
- slow transport of materials
- difficulty in locating and recruiting persons who should have been involved in the project
- lack of interest by political leaders (in particular in external technical assistance projects)
- lack of good communication with political leaders
- delays in formal authorizations
- insufficiently clear structure for decision-making
- lack of coordination between people in different roles
- lack of common understanding of project objectives
- delays in delivery of funds and materials
- insufficient funds and materials
- lack of skilled manpower
- departure and replacement of key persons
- too rapid rhythm of implementation
- problems in social relations between team members and others (TA projects)
- significant differences in cultural values (TA projects)
- inappropriateness of the colonial educational system to the needs of the country

There are various ways of grouping and analysing these data. For the purpose of clarifying what is meant by I - and how it may occur at different phases of the problem-solving cycle, we may make the following generalizations:

(a) A few items (colonial system inappropriate, problems in social relations, differences in cultural values) are independent of the infrastructure as we have defined it. Rather, they are endemic to the situation in developing countries in general and to technical assistance projects in particular.

(b) Several items suggest that the problem occurs at the third phase of the cycle (the proposal of a solution and particularly the drawing up of a plan of operations): long distance, slow transport, difficulties in recruitment, insufficient funds and materials, delays in deliveries, lack of skilled manpower. These are problems which, in many many cases, could have been *anticipated* and, to some extent, taken into account in the plan of operations. They indicate that the goals and the schedule of operations may have been too ambitious in relation to the capacity of the infrastructure. For example, in the quantitative analysis of the survey, slow transport, long distance and delays in delivery are, quite logically, highly intercorrelated. When they appear in a given project, we can assume that the plan of operations did not take sufficient account of the geography or communications system of the country and called for deliveries before they could realistically be expected. Also, reliable baseline data would have indicated how many trained persons were actually available or how much funding was, in fact, likely to be committed to the project.

(c) Two items (lack of interest and lack of understanding by political leaders) are difficult to interpet in this context. Very often, they appear in technical assistance projects as a problem identified in particular by the foreign expert. We shall discuss them in the next chapter.

(d) Seven items concern more directly the implementation phase (lack of communication, delays in authorizations, decision-making structure, departures and turnover, too rapid rhythm of implementation). Here, the infrastructure appears to be deficient in communicating and co-ordinating all the messages which need to be passed at specific moments in order that the project be carried out as planned. These are routines or performances which education systems typically count on to be dependable. When they are not dependable, partly because of miscalculations at the phase of designing the innovation, we can imagine the possible result simply by looking over the list of barriers, several of which could occur at the same time. The larger and more ambitious the project, the more quickly and irreparably a given innovation can be compromised by any one barrier through a series of chain-reactions.

(e) For any single project reporting a great number of these barriers, we can assume that the solution proposed was both inappropriate and impracticable. When this happens, we can also deduce that something went wrong earlier in the cycle. That is, the infrastructure for diagnosing needs and planning solutions for them was unreliable, so that the solution could not be implemented as designed. The fact that the so-called 'showcase projects' – highly visible and externally funded literacy programmes in selected villages or factories, large networks of experimental schools in rural areas, multi-purpose educational television and radio projects, centralized teacher-training and curriculum development institutes – are particularly prone to this problem suggests that the 'solution' was decided on before the problem had been adequately defined.

In subsequent chapters we present specific examples of I- at precise moments in the problem-solving cycle. For the present, we will limit ourselves to three examples of *general* patterns with I - in large-scale innovative projects:

From de Wilde's conclusion to an Indian out-of-school adult training project:

> In any event many of the suggestions made in the survey reports have not been carried out for a variety of reasons: lack of continuity in project staff, inadequate information on resources, impractability of the proposals, insufficient technical know-how on certain industries, and lack of entrepreneurs. (3)

From an interview with one of the persons responsible for a large-scale educational television project in Africa:

> This was a huge project, but there was no structure for managing and administering it. We had to rely on the same administrative machinery to service a massive new project. Things like visas, requests for materials, clearing budgets were all held up for months. The most useful people have been the ones who had good personal contacts in the ministries and could make things happen faster.

From a summary of a Latin American literacy project in the Unesco assessment of the Experimental World Literacy Programme:

> The major shortcoming of the project was the lack of government financial and logistical support... The most graphic demonstration of this was the project's inability to recruit and maintain a skilled teaching staff and other professional personnel at competitive salaries. High staff turnover resulted in a strain on the training machinery which ultimately diluted the quality of the project's teachers, and forced the enrolment of participants to be cut.
>
> A second obvious shortcoming was the failure to implement the 'functional literacy' concept in the manner foreseen. This problem appears to be partly attributable to the failure of the government to establish close links between the project and the wider development efforts, and partly to high-level misunderstanding of the concept itself (the literacy and vocational components of the project were frequently viewed as parallel, but not integrally related activities). This conceptual confusion in turn was exacerbated by the dearth of funds which precluded the possibility of training an instructional staff skilled in both literacy and vocational-instructional techniques... (4)

I – C + A + . It is possible, however, to have an educational system with I – and yet successfully to implement a large-scale innovation. But the configuration is an unusual one. It assumes that the orginators or executors of the project have full control over the people and decision-making structure in the project, while enjoying wide popular support. These are likely to be charismatic leaders operating under a social mandate which can generate enthusiasm from other leaders and from administrators, teachers, students and local officials. The numerous problems encountered in implementation, many of which may have resulted from rapid planning and overambitious solutions, are overcome simply by the energies and commitment of the people concerned. The 'doctrine' behind the project is so strong that everyone can call on it in moments of crisis or paralysis as a remedy to the problems encountered. Teachers work more hours, students volunteer for administrative or physical work, village leaders donate materials and convince the population to contribute, to be patient or, in the case of many adult training projects, to stay with the training despite their reservations.

As mentioned earlier, there are few countries in which this constellation can be maintained beyond the introductory phase of an innovation. After the initial period of enthusiasm, the difficulties of staying with a project which involves uncertainties, risks, moments of discouragement and temporary sacrifices – as most innovations do – are such that we have either I – A + C – or, worse, I – A – C – . It is the combination of an internalized doctrine and inspiring leadership which brings a project through these moments. In our sample, there are indications that this pattern is associated with (a) certain types of projects (what we have called 'crusades' in adult literacy, the creation of multi-purpose rural education centres and skill-training programmes for village leaders), (b) specific types of political government (highly socialist), (c) stable political leadership (i.e., low turnover in presidency and/or among principal ministers) and (d) strong accent on a self-help approach to development, in which outside technical expertise is either not used at all or is brought in at a later stage in the problem-solving cycle.

I + *A* – *C* – . Although this configuration is found rarely in our sample, some instances are well-documented in highly industrialized countries. In a project of this type, the planning and administrative machinery functions smoothly during the initial phases of the problem-solving cycle, but the solution, while apparently rational and cost-beneficial, is unacceptable on political or social grounds to most of the people concerned, including many of those responsible for implementing it. An example would be an obligatory education programme on birth control or a rural teacher-training programme designed to integrate the teachers' role and the school's function into village life to the extent of cultivating plots on the school grounds. Typically, these projects run into difficulty at the implementation phase, where there is no demand for follow-through (A –), open resistance (C –) and subtle deformation or 'sabotage' of the project causing it to be continually modified until it takes on a form more acceptable to the users.

I + *A* + *C* – . Projects corresponding to this profile tend to be well-planned and rapidly implemented. The basic problems appear later, on close inspection of what is actually going on inside a classroom or at the close of a training project when students are sent out to plant crops, to teach children or to read more work-related literature. A number of clinical studies show that people who are unwilling to do something (C –) find innumerable ways of conforming superficially to the requests or orders of their superiors (assuming A +) even while they resist those orders or take up their former behaviour patterns when they are not being supervised. Innovations in education are particularly vulnerable to this phenomenon in that people have more and better occasion for resistance. Teachers are invisible to outsiders 90 per cent of the time in their classrooms; those who train children or adults are not the same people who observe them at work or at home after the training is completed, and the two institutions (school and non-school) seldom consult with one another. This form of passive resistance is very difficult to detect, much less change. Moreover, in the configuration I + A + C – it is likely that the authorities would be unwilling to negotiate any changes (tending to have a firm belief in the efficacity of I and very likely not having sought to consult the users at the outset) and may even by satisfied with a superficial level of implementation (as long as it strengthens their confidence in I and in their own A).

A typical example, often observed in studies of teacher education programmes in both developing and highly industrialized countries, is the 'model' lesson taught to and demanded of trainees during their period of pre-service training but seldom used by the trainees during unsupervised classroom work or beyond their period of training. Several micro-teaching 'clinics' for in-service teachers appear to follow the same pattern. And, at the level of obligatory schooling, lessons in civic or religious education are classic examples of this phenomenon, familiar to most of us.

In this connexion, the argument is often made that once the *situation* is changed, behavioural and attitudinal changes will follow, i.e., I + and A + will assure that some parts of the innovation are implemented in a durable manner, even with C –. There are few rigorous studies to confirm this claim, but intuitively the point makes some sense. One fairly rigorous study of desegregation in the USA showed that the most successful instances occurred in communities and institutions where the people in power simply imposed a sudden and irreversible change, where the sanctions for the change were consistent and painful and where the new policy was clear and unequivocal (5).

As a further commentary on this study and its pertinence to the innovations in developing countries which we have studied, we would say:

- that people who are forced to try out new ways of behaving will find some of them to be more acceptable than they had originally thought;
- that this strategy is used more frequently than might be imagined. At the national level, many projects in both developing and highly industrialized states are introduced in this way because of the leaders' sense of urgency or from commitment to a given policy or law;
- that it is very difficult to maintain firm and painful sanctions over time, except in the most authoritarian forms of government, and then only in certain types of projects;
- that the necessary combination of components for a 'power-coercive' strategy, I +, A +, is, to judge from our data, infrequent in developing countries.

I – A + C – . According to our model, we would expect a very erratic follow-through on a project of this type. Also, there could be more effective passive resistance on the part of the users since I – provides many ways of sidetracking the project. Several 'showcase' or high visibility projects correspond to this profile. The educational or political leader bases his reputation or authority on a project which he or his advisers have conceived. He spends much time and effort in intervening on behalf of the project (giving television and radio speeches, handing out diplomas, making inspection tours) and in channelling more funds and personnel to the project when (as frequently happens) there is confusion, delay or lack of co-ordination. Because he is getting little systematic feedback on the progress of the project (due to I –), he tends to rely on the encouraging reports of his advisers or inspectors, who return from rapid inspection tours unaware of C – or, if aware, unwilling to deliver an unfavourable report to their hierarchical superiors.

In this case, it is not even possible to achieve the formula I + A + whereby innovators can be assured of *some* minimal change in the longer term performance of people involved in the project. Furthermore, there often seems to be some problem here in determining C. This point is made in an interview with an African director of a teacher-training institute:

> People follow along with what you're asking them to do, but when you're no longer there, they give it up. The people will go along easily, but they don't really accept the changes. You can introduce all the innovations you want, but you can't be sure at all that anything will really change.

I – A – C –. When implementation is unreliable, leadership erratic and agreement on objectives low, we can predict that the final form of the innovation will not resemble the original design and that little effort will be made to fully implement the project as planned. In some instances, this profile corresponds to a particular phase of an innovation which began with the profile I – A + C– ran into a great number of barriers and was, in effect, abandoned by the educational leadership, which turned its attention to other more promising projects. Lallez's analysis of the initial phase of the CER project in Upper Volta (6) reveals this profile. As Lallez shows, however, the investment of foreign funds and expertise, along with the urgency of the rural educational programme in Upper Volta, forced political leaders to reaffirm their commitment to the project. The project was then handed over to an experienced high-level administrator, scaled down and better linked to existing rural vocational training and employment units. Taking into account that there will probably be continuing difficulties in implementation, we now have the formula I – A + C + to describe the project which, in fact, appears to have been successful after these changes were made.

Small-scale and local projects

Up to now, we have been discussing large-scale innovations at the national or provincial levels and involving large numbers of people, resources and 'connexions' in the problem-solving cycle. Also, many of these projects are supported by external technical and financial assistance, often from more than one source.

The model changes somewhat when we move to smaller-scale projects, in particular those initiated at the local level and involving fewer persons, demanding little administration and profiting from little external assistance, at least in the first years of implementation. The combinations of the model presented above are still relevant, and they should predict both the type of problem likely to arise and the probability of successful implementation of the innovation. But the change of scale and locus have an effect on the interaction between the components. More precisely, in the case of smaller-scale innovations, we would anticipate the following patterns:

Infrastructure. I – becomes less of a problem or, put another way, I + is easier to achieve. It is easier, at the village level, to recognize a genuine need, analyse it operationally and devise an appropriate solution for it. Most of the necessary information can be collected quickly and directly from the persons expressing the need for change. In the implementation phase, problems of co-ordination, communication, turnover, lack of common understanding and a too rapid rate of implementation are either non-existent or at least more manageable. Most people connected with the project are close enough to it at all times to monitor its progress without intermediaries and thus able to intervene rapidly in case of some deviation. Leadership and participation are more stable, i.e., there is little turnover of key persons at the local level.

This increase in the transparency of and thus the control over a project leads naturally to more predictable outcomes. One pays, however, for lowering the scale of an innovation by obtaining fewer results less quickly. The relationship between scale and predictability can be further illustrated by some of the results of our questionnaire. Two of the questions refer to *revision in the plan* of operations for the project (Was the plan revised? With minor/infrequent revisions or with major/frequent revisions?) and to the *scale* of the project as measured by the average annual UNDP contribution (dichotomized to less than $200,000 and more than $300,000). In the responses, there is a fairly strong relationship ($C = .39$; $p < .02$) between scale and revisions. That is, projects over $300,000 tend to make frequent and major revisions in the initial plan, and projects under $200,000 tend to make infrequent and minor revisions. *

Consensus. C becomes relatively more important than I in small-scale or local projects. Without consensus, notably at the local level, it is very difficult to implement an innovation. With C + , implementation is likely to be automatically effective, provided that this consensus can be maintained when the first obstacles appear. Schematically, this is due to the following factors:

– Most innovations in education at the local level are centred on people rather than on technology. Even technology-centred projects (instruction by tv or radio in village classrooms, teaching adults to use new planting techniques, fertilizers or machinery) are heavily mediated by the people connected to them. Since few people are concerned at the local level, it takes fewer people to hold up or reject implementation of an innovation.

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* To be sure, the fact that this sum refers to *external* assistance is an important variable to be examined later.

– At the local level, problems are analysed and decisions made about solving them far less on the basis of rational criteria than on the basis of relationships between the people concerned. If the village teacher is a young outsider and perceived as being primarily a teacher of children, he will probably be unacceptable as an adult literacy instructor, despite the fact that he can read fluently, is a certified teacher, is available, has the necessary materials and facilities and has access to other materials and expertise in the provincial education office. He may be the most logical person for the job in a technical sense but he is also the least appropriate in a social and psychological perspective.

Authority. A becomes more dependent on C in small-scale or local projects, especially when the innovation is locally initiated. Village leaders are physically and administratively closer to their constituents. They are leaders because they can maintain a precarious balance between opposing persons or groups, but, unlike the ministry official or national political leader, they do not usually have the power to upset that balance drastically (e.g., by introducing a major change in village life which would inevitably alienate some influential people). Nor can they as leaders appeal to a more universal doctrine or policy if such a policy would involve conflict between the members of a village all of whom are in daily contact with one another. For example, a minister of education can, in the name of a national crusade to upgrade the level of instruction in his country, initiate and enforce a programme of using university students as literacy instructors in villages (although problems are likely to come up at the local level during the phase of implementation). Similarly, a school inspector can invoke a particular regulation to oblige teachers in his district to adopt a new practice of evaluating pupils. In contrast, an effective village leader probably knows that neither his authority nor the force of any doctrine will suffice to overcome personal oppositions in the village. His authority is based more on his popularity within the village than on his power outside of it. (Of course, there is another kind of village leader who is more an administrative official of the government than anything else; with this type of leader and an innovation which is not locally initiated but rather implemented within the village at the initiative of the provincial ministry, we would expect the same kind of surface conformity as described earlier.) Without this authority, he knows that villagers will not go voluntarily to literacy classes, simply in the name of some government policy. They and their friends will be more influenced by such potential consequences as humiliation in being taught by their children's instructor, having to perform and perhaps to perform poorly in front of others, etc. For the village leader, such potential discontent, conflict and discouragement can be more meaningful than the government policy decision. By contrast, political leaders or ministry officials, (a) are not obliged to observe or deal daily with these difficulties at the local level of implementation, (b) are aware that any innovation in the national interest will cause discomfort or conflict among some of the parties concerned, (c) are elected or appointed to carry out policies or enforce regulations, rather than to mediate day-to-day relations.

In summary, we would predict that C + is a critical component at the local level in order both to *initiate* and to *implement* an innovation. Also, when C + is obtained at this level, I + and A + are more likely to accompany it.

New elements and new behaviours

Finally, in talking about the scale of an innovation, it is necessary to introduce an important distinction which makes our model slightly more complex but allows us to analyse the projects better. Schematically, when we refer to differences in scale in projects, we mean two things. First, we mean a project which has a greater or lesser number of elements in it: *people* (who teach and are taught, administrators, foreign and national experts, etc.), *materials* and other technical resources and what we have called *connexions* (plans, communication, decisions and co-ordinating arrangements which connect the people with one another and with the materials). An in-service teacher training programme designed to reach all the teachers in the country in order to familiarize them with a new study plan is an example of a project with a multitude of elements. Secondly, there may be projects which contain few elements but which require people to behave in ways that are more or less radically different from their customary behaviour. For example, birth control projects or courses to experienced farmers on new techniques for planting or ploughing crops are more ambitious on a behavioural level than in a material sense.

This distinction would yield the following permutations in our theory:

1. large-scale in elements (EL +), large-scale in changing people's behaviour or attitudes (BC +),
2. large-scale in elements (EL +), small-scale in behavioural changes (BC –)
3. small-scale in elements (EL –), large scale in behavioural change (BC +)
4. small-scale in elements (EL –), small-scale in behavioural change (BC –).

As we review the different combinations of the I A C model, we can make the following generalizations:

- A country which aims at both EL + and BC + in a given project is likely to succeed only if it has a well-developed infrastructure (I +) to process all the elements, and a strong leadership or control function (A +) to be certain that the users will try out the new behaviours over a sufficient duration to insure their having a chance of being durable. Ideally, these projects would have full consensus (C +), but with BC + there are certain to be groups of people unwilling or unable to accept such a radical change in what they ask of themselves or what others ask of them. In short, EL + and BC + are not likely to succeed unless there is I + A + C +, although a more likely case (still with a chance of success) would be I + A + C – .
- A project with many elements (EL +) but few demands for new behaviours (BC –) –for example, opening several additional teacher-training institutes without modifying the basic curriculum or teaching methods–will need a reliable infrastructure (I +) but can probably succeed with A – and is not likely to have problems of consensus (C +).
- An innovation with few elements (EL –) but a high expectation of behavioural change (BC +) –for example, a village clinic for birth control–does not require an elaborate infrastructure, but will not get beyond the design phase without A + and, ideally, C +.
- Finally, projects involving EL – and BC – are the easiest to implement because they require fewer human, material and logistical resources and have low goals for new behaviours. They can be implemented with some measure of success with I – A + C – or even I – A – C –.

CONCLUSIONS

The components of this model can now be used to analyse the actual patterns observed in the innovations in developing countries exposed in the case study literature and in first-hand accounts. Such an analysis leads us to the following conclusions.

Ideal requirements

In a very large number of educational innovations in developing countries in all geographical regions, there is an attempt to make a major quantitative and qualitative breakthrough (EL + , BC +). Such a major transformation requires a complex and reliable infrastructure (I +), strong and stable leadership (A +) and, ideally, widespread popular support (C +). In most of the projects analysed, these requirements are not met, with the result that the innovations are either slowed down, reduced in scale, deformed in relation to the original design or discontinued. The few innovations which come close to meeting these requirements, such as the ACPO project in Colombia (8), appear to have been successful. That is to say, they are fully implemented, they continue to operate according to the orginal design after the initial supplementary energies and resources have been removed or reduced, they attain many of their stated objectives, and they give rise to similar, larger-scale projects elsewhere.

I –.

As mentioned earlier, the particular problem in many of the projects surveyed lies in the weakeness or unreliability of the procedural configuration or infrastructure (I –) in relation to the number and variety of elements to be processed in the project. This is partly, but only partly, a problem of *resources* (funds, materials and equipment, numbers of highly trained cadres or technicians, a communications infrastructure for transporting people, materials and information). The problem is also one of lacking the *procedures* for designing and implementing an innovation, of the education system not having the capacity to register and process a large number of different messages concerning the project in a rapid and reliable manner.

In several case study reports, the disproportion between the ambitions of EL or BC or both and the state of I is the dominant theme. For example, in his account of the Kibaha Educational Centre in Tanzania—a multi-purpose facility for professional training in public health and hygiene, in agriculture and food production—Mhina draws attention to some of the difficulties and delays and concludes:

> Five years are not sufficient in a developing country to produce officers who are sufficiently trained and experienced for a project as large, delicate and revolutionary as Kibaha. (9)

In the IERS study on the Mostaganem Institute of Agricultural Technology, the authors conclude with a list of elements which were absent or insufficient in the project. Without these components, 'although mass education policies are of course consistent with the country's needs, (these policies) can not be made to work' (10). Similarly, insufficient infrastructure in various phases of the problem-solving cycle is the most frequent type of difficulty mentioned in the Unesco evaluation of the Experimental World Literacy Programme (11). It is also, as shown earlier, the principal barrier to implementation mentioned in the survey and derived from our content analysis of project evaluation reports. Analysis of the survey responses also shows that although 71 per cent of all projects and 76 per cent of 'very ambitious' projects contained clear plans for implementation specified in writing, these plans had to be revised in 46 per cent of all projects and in 70 per cent of the very ambitious projects. This would indicate, as suggested earlier, that (a) highly ambitious innovations have more unpredictable outcomes, (b) clear plans for implementation do not appear to limit the ambitious objectives of the projects, which in turn suggests that (c) there is a disequilibrium between ambition and follow-through, very likely due to I – and that (d) the infrastructure is also unreliable in the earlier phase of the problem-solving cycle, i.e., in the analysis of the need for change and the design of a realistic solution.

Compensation for I –

Given the weakeness of the infrastructure, the next best solution in cases where large-scale change is sought would be to compensate for I – with A + and C +. Here, one calls on strong links between the national leaders and local officials, on popular enthusiasm and on the presence of powerful social doctrine to carry the project through numerous logistical obstacles. As noted earlier, literacy programmes in Algeria, Cuba and Tanzania appear to have used this formula with success. However, these projects appear only under particular conditions which are very difficult to maintain. Also, I – is a very problematic factor, difficult to compensate for, particularly when there are many elements (EL +). It plays less of a role, however, with EL – BC +, which is often the configuration in the literacy projects. I – results in delays, confusion, wastage of already scarce resources and, as a result, in discouragement and exhaustion which in turn may lower C and eventually A.

Limitation of scale

Another alternative with I – is, as suggested earlier, to limit the scale and scope of the innovation. By lowering EL, one needs a less elaborate infrastructure; by lowering BC, one is more likely to achieve C + (or at least to avoid C –), and to require less A, to the degree that the psychological demands on the users are lessened. This solution appears to have been adopted in one of the most successful innovations analysed in our study, a Caribbean regional curriculum development and teacher training project to be discussed later in more detail. Unfortunately, it would appear that political pressures, along with weaknesses in the problem-solving cycle during the planning phase, rule out this option in a great number of cases in which it would be, in fact, the most viable solution.

The exception to this is locally initiated innovations which cannot marshal the resources or authority to attempt major change, except in times of crisis. In these projects the innovators are usually *unable* to implement until they scale down EL and BC to the point where there is a minimally adequate level of I + and C +. As a result, these innovations, while being relatively more modest, appear to have a fairly high rate of successful implementation. Many, in fact, seem to have been singled out, albeit much later, by provincial or national education officials for trial on a larger scale.

Multiple combinations: the four project types

In reviewing a large number of recent educational innovations in developing countries, we have been confronted with all the possible combinations of these project patterns. Some patterns, however, are found more frequently than others, and they tend to produce similar outcomes despite the different national settings. We have also implied that certain configurations result in more successful design and implementation of projects and have tried to show what these configurations are and why they lead to success, or at least to greater predictability and control over the outcomes of the innovation.

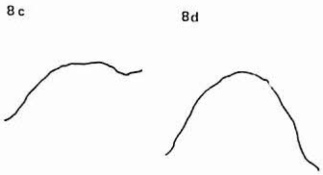
We shall now outline four of the most typical project patterns, using data from our four sources of information (case study, literature, project evaluation reports, survey responses and interviews) to illustrate them. These are, of course, arbitrary and approximate categories, and no single project fits nearly into any one of the four. Nevertheless, this kind of clustering is useful in illustrating some of the typical forms which an innovation can take as it traverses the problem-solving cycle. In terms of the model, these four patterns are as follows:

- quest for EL + BC + with I − A + C − or I − A − C − ('alternative of grandeur'),
- quest for EL + BC − with I − A + C + or I − A + C − ('controlled expansion'),
- quest for EL +/EL − BC + with I − A + C + ('crusade'),
- quest for EL − BC − with I + A + C + or I + A + C − ('small-scale and local').

PROJECT TYPE 1: THE ALTERNATIVE OF GRANDEUR

In the first type of project, the growth gradient (see chapter II) approximates two alternatives:

FIGURE 23.



That is, there is a rapid rise, followed by a rapid decline or, more often, a rapid rise followed by a slowing down, after which there is continued stabilization or, in some cases, a slow decline.

Antecedent conditions

Strong desire for radical change; independence. At the base of these projects is a strong desire for radical change prompted by many of what we have called 'precipitating conditions' for innovation: the sharp reduction in colonial influence due to recent independence; the mobilization of the political élite to meet the country's needs with indigenous solutions; a widespread popular desire for new or better institutions after independence; the presence of national leaders who embody the new ambitions; and economic and political pressures from neighbouring countries. This phenomenon leads to an awareness that the needs of the country are urgent and enormous and that the colonial education system was, and still is, inappropriate to meet these needs. As this awareness was phrased by a ministry official from an Arab State during the interviews:

> We have realized that 85 per cent of our secondary school teachers are not qualified to teach in either the traditional school or in the more vocationally oriented schools we have conceived as a better model to meet our needs.

Inappropriateness of colonial system. Often, the strength of the desire for change is related to the degree to which the colonial education system is seen as inappropriate. That is, as the desire for an indigenous solution increases, the colonial heritage seems more and more burdensome and, as a result, the impatience for rapid, massive change grows stronger. In our survey, this pattern appears to fit fairly closely projects in sub-Saharan African countries (it also fits one or two Caribbean and Latin American projects). For example, the perception that the colonial education system was inappropriate to meet the needs of the country constituted a 'very' or 'extremely' serious barrier to the innovation in 82 per cent of the sub-Saharan projects represented in the survey, as against a mean of 18 per cent for all other regions (with a range from 14 to 33 per cent). The differences are highly significant ($p<.001$). If the same data are analysed by language, this problem is considered 'very' or 'extremely' serious by 84 per cent of those responding in French (of whom approximately 85 per cent are from sub-Saharan countries), as compared to 47 per cent of those responding in English and 9 per cent of those responding in Spanish. Finally, the sense of urgency is heightened by the perception that the struggle for independence has left the educational structure in a state of disorder. Survey responses indicate a close and moderately significant relationship between this perception and the seriousness of the problem of an inappropriate colonial heritage ($C = .27$; $p<.05$).

Insufficient internal finance. Another characteristic of these projects is the problem of marshalling sufficient resources from within the country. It is likely that, in many of the countries in which this pattern is found, there is a low GNP or per capita income. We have then high ambition combined with low level of internal finance, which suggests (a) that the projects may not be able to call on sufficient funds for the difficult or unexpected moments that are almost certain to appear; (b) that there will be the temptation to look *outside* the country for funding. This situation appears often in the case study literature. In the survey responses, we deduce the financial state of the country by the presence or absence of problems of internal finance for the project. This problem is more serious in sub-Saharan African and in Asian projects than elsewhere. Moreover, the seriousness of the problem of internal finance correlates significantly ($C = .31$; $p<.02$) with the seriousness of the problem mentioned earlier, that of the inappropriateness of the colonial education system.

Youth. A final element characterizing these projects is what we may call 'high permeability' to new inputs or 'system openness', i.e. the system is open and receptive to new ideas. The degree of ambition in many of these projects is itself an indication of openness or, more specifically, of the willingness to take risks. The case study literature—which here again singles out African projects on this dimension—suggests that the system is open because it is young and because its members are young. That is to say, projects fitting our pattern are likely to take place in newly independent countries (with new decision-making structures) and/or with young political leaders (who are generally less experienced but more audacious than are older officials). The survey responses also show that the opposition of the political and educational élite is *not* perceived as a serious barrier to educational innovation in these teacher-training projects, in particular in sub-Saharan African projects, where such a barrier is not observed or is judged as 'not serious' by 77 per cent of those responding.

Need processing, problem definition, solution building

In the next phase of the problem-solving cycle the pattern in this type of project is the following.

Rapidity. Political leaders tend to feel that the country's needs are clear enough and that the urgency of those needs requires immediate, large-scale action. Many of the appropriate solutions are also perceived as being relatively easy to arrive at: for example, the high incidence of illiteracy can best be attacked through a nationwide literacy programme; the traditional primary school study plan clearly requires a more vocational bias; large numbers of untrained or under-trained teachers can be reached by national tv and radio programmes, etc. There is a rapid cycle of planning, almost entirely in quantitative terms (numbers of staff required for cohorts of students, numbers of months necessary for production and distribution of materials, unit costs for hardware). Far less attention is given to likely constraints in implementation or even to the precise amount and quality of local personnel and materials which would be in fact available specifically for this project. A fairly detailed plan of operations is elaborated, in which dates are specified for completion of each separate activity.

The planning process is studied in far greater detail in chapter V. But it is worth pointing out here that both the rapidity of the planning exercise and the tendency to rely on pre-planning statistics which are not fully reliable, provoke, in the implementation phase, a number of unanticipated problems. This pattern is well summarized by a technical adviser with 20 years of experience in a variety of projects corresponding to this project type:

> It is fair to say that the planning of different phases in many of the projects is pretty much *'fantaisiste'*. It is really very difficult to do good planning, and we find that in most cases things don't turn out as we planned, so we end up by not paying too much attention to the plan. Perhaps if we could plan better, that wouldn't happen, but I'm not sure of that.

Scale and technology. These needs are diagnosed and solutions found for them by senior planning and ministry officials, often with the aid of foreign experts. This national élite may be seeking to make its mark on the country, to emphasize and credit its leadership through a major, highly visible project which could constitute a breakthrough. There are two immediate consequences of this. First, it is decided to implement a full-scale rather than a pilot project, on the premise that pilot projects are too time-consuming and the needs too urgent. And this entails, for example, a major training centre, nationwide literacy programme or radio-tv broadcasting network becoming operational without those involved having any prior *experience* of this type of operation, i.e. without the possibility of *anticipating* with any certainty the types of difficulties which a project of this nature and scale is likely to meet. This calculation–increasing the risk in order to get rapid and major results–is only viable when the infrastructure for implementation is extremely well-tuned so that it can deal both with the ongoing operations of the project *and* with unexpected events.

A second consequence of such a choice is that the solution often includes a major technological component. Theoretically, technical systems represent savings in human labour or even allow for achievements which would be otherwise impossible. They also provide faster connexion between people, especially in geographically isolated areas, thereby making possible the transmission of a greater volume of messages. More simply stated, people can do more in less time. In particular, they can produce more (for example, educational materials) and can communicate more rapidly with a greater number of people (for example, distribute these materials throughout the country or communicate them by radio, tv and newspapers). The appeal is obvious and includes the possibility of attaining rapid and widespread results, a highly visible and often prestige earning product, increased control over the performances of the public concerned, or the launching of a 'modern' innovation in the typically traditional domain of education. But the prerequisites for success in such a venture and the difficulties that may arise even if many of these prerequisites are met are just as impressive. Below is a partial list, drawn from examples in the case study literature and project evaluation reports.

- It is imperative to have a well developed technical infrastructure (e.g. electricity, maintenance and repairs, expertise), and yet this is seldom the case (12);
- well-designed materials require highly trained people, who are in short supply, and take time. As a result, the software is often inferior or insufficient (i.e. lags behind) in relation to the hardware;

• programme material which is not field-tested goes 'blindly' to the user, for it is designed without knowledge of how well it will fit the situation and the learner. Even when attempted, it is not often that such pre-testing can be carried out successfully, particularly when the public varies widely in educational level, language, age, cultural background, etc. Field testing, once again, is both costly and time consuming; and it will not solve the problem of confronting different conditions in the target public in other sites. Several innovations (13) are handicapped by this problem;

• learning is a slow, uneven process. Providing more materials more quickly and more intensively to more people does not ensure faster or more durable learning, although it does increase the chances of such learning if the materials and pedagogical support are good;

• cultural and psychological factors can intervene unexpectedly. For example, people accustomed to face-to-face contact may not accept (or simply may not learn from) materials-based programmes. Teachers may not be willing or able to integrate them into their lessons, except in an auxiliary fashion;

• these innovations often turn out to be more expensive than had been projected. They also increase dependency on other systems, notably on the countries which produce and provide much of the equipment, materials, spare parts and repair facilities. This dependency may result in unforeseen delays, shortages and higher costs.

Role of outside finance and expertise. In this particular pattern, there is evidence that outside expertise and finance are brought in at an early phase in the problem-solving cycle. This is potentially a problematic policy; it appears that later and lesser (or at least more staggered and decentralized) expertise and finance from without make for a more effective formula.

If we limit our frame of reference to the interviews and survey responses concerning projects in UN-supported teacher-training projects, the role of external aid in this type of project (EL + BC +) contains the following elements:

– early intervention. Bilateral and multinational experts are involved in the analysis of needs and in the planning cycle leading to the design of an innovation. They are there either in relation to other ongoing projects or are somehow 'stationed' in strategic positions within the country.

– design and support. There are indications that many of the solutions proposed come to a large extent from these experts. As such, they play an important role as 'cosmopolitan' change agents: people familiar with the system, yet familiar as well with other systems having similar needs; people having sufficient status and credibility to bring this information, along with their suggestions, directly to those who plan and decide in the ministry. They are also listened to for two other reasons: first, as temporary or external experts, they are not threatening to the authority structure nor to the personal interests of nationals who might lose a relative advantage if the proposals came from a colleague. Further, these advisers are linked to agencies which can make available more expertise as well as external funding in the form of materials, fellowships and travel. As a result, it is often these experts who draw up the initial requests for outside assistance and who therefore help to draw up the plan of operations.

–type of solution proposed. There is some evidence, coming in particular from the interviews, that when external advisers are involved in all phases of the planning cycle, but especially at the beginning, the final design of the innovation may be less national than international. That is to say, with the exception of the most recent projects, there is a tendency to create national or regional centres, networks or institutions, rather than a series of small-scale local projects which are different in scope and shape, although coordinated at the provincial level. Behind this decision is the suggestion that bilateral or multilateral agencies may be looking for experiments which can be generalized to other countries rather than for specific solutions for a need in a particular national context. The Experimental World Literacy Programme (14) is an example, although far from an isolated one, of this phenomenon. Another aspect the problem here is that experts, aware of which kinds of project proposals are likely to be funded, may modify the original design in order to increase its chances of being acceptable for assistance. Finally, many of the solutions give a prominent role to the bilateral or international agency: large numbers of experts, long duration, equipment, fellowships, etc. This, of course, increases the budget of the agency itself and gives it relatively more prominence and influence than other competing agencies.

– plan of operations. Our data suggest that when external advisers are on hand during the planning cycle, the final plan of operations tends to be more precise and detailed than might otherwise be the case. The funding agencies usually require a well-elaborated plan of operations before full approval is given, and this requirement seems to encourage ministry and planning officials to take a closer look at the obstacles likely to be encountered during implementation. Unfortunately, as shown earlier, there is no indication that detailed plans of operation increase the realism of projects. This is an important point, which is developed later and which may reflect (a) the limits or primarily quantitative planning, (b) the hazards of entrusting much of the planning to external advisers, (c) what happens when well-elaborated plans are implemented in a less well-developed infrastructure and (d) the fact that a 'plan' typically makes abstraction of the political and institutional situation, that is, of the conflicts or compromises inherent in carrying out *any* project or, in the language of our model, of the configuration of and interaction between A and C.

Synopsis of this phase. Looking at the survey data, we can provide more concrete illustrations of this type of project in the planning and design phase. As we have seen, the desire for change is coupled with insufficient internal finance and with youthful leadership. This pattern corresponds most particularly but not exclusively to French-speaking sub-Saharan African projects. Once the desire for change is made clear, we have the following configuration: the decision to launch a large-scale innovation (EL + BC +), the appeal to outside assistance and the design of a fairly detailed plan of operations which does not, however, increase the realism of the objectives. Below are the survey results pertinent to this configuration:

• of all those projects receiving annual outside (UNDP) funds of at least $300,000, 76 per cent feel that the inappropriateness of the colonial system is a 'very' or 'extremely' serious problem.

• the sub-Saharan African projects tend to be highly funded (62 percent of all projects over $300,000 annually), relatively long-term (40 per cent of these projects are from 6-9 years), carefully planned (judged to be the case in 68 per cent of the African projects, as against, for example, 31 per cent of the Asian projects), but more likely to have 'very ambitious and probably unattainable' objectives (32 per cent as against a combined mean of 12 per cent for the other regions).

What strikes one immediately, of course, is the incongruity between 'carefully planned' projects and 'unattainable objectives'.

Plan for implementation. In the final plan of execution, the project appears as large-scale (EL +) and as requiring new roles or behaviours (BC +) on the part of the target public. It is buttressed heavily by external technical assistance and it calls for rapid and widespread implementation. Prior to or during implementation, the president of the country or the minister of education may make a series of political speeches in support of the project. This scenario is common in the case study literature and appears as well in the survey responses (moderately high correlation between the frequency of such political speeches and (a) projects with ambitious or very ambitious objectives–C = .37; p<.10–and (b) inappropriateness of the colonial education system as a very or extremely serious problem–C = .43; p<.10). The high frequency of such speeches is important. It indicates that the project may not have been negotiated in detail with all the concerned parties. This would be due to the perceived urgency and the scale on which implementation is foreseen (too many consultations necessary; impossibility of reaching consensus on such a large scale). The speeches are then designed to offset any initial resistance by putting the authority and prestige on the president or the minister firmly behind the project. However, the fact that implementation is general, rapid and unnegotiated poses a number of problems in projects which involve local or rural participation. Lallez has captured the sequence of events and outcomes in this phase of a project corresponding to the pattern we are now discussing in his chronologies of the Upper Volta CER project (15) and the Cameroon IPAR project (16). The CER project, he notes, would have been far better received had the implemetation been designed in a more gradual and less administrative manner:

> The nature and goal of the operation justified the fact that, while the dangers they may present did not go unheeded, means of social persuasion–which would, of course, have had to be adapted to the country's resources and to its inhabitants' mentality–were not excluded. The project would, at any rate, have had to be supported before its launching and during its establishment and operation, by social leadership of a rural character. (17)

And later, in reference to the plan of implementation at the village level:

> These recommendations or rules were only seldom followed, so that the setting up of the CER was perceived by the community as the outcome of an administrative decision and had to be carried out and followed up in accordance with general, previously established norms laid down administratively. But it is clear that this manner of apprehending, deriving from the manner of creating, was going to strengthen, in the perception of it and the idea it was to convey, the analogy between the CER and what in administrative terms was most like it, i.e., once again, the traditional school. This first analogical perception certainly played a decisive role, for it immediately brought about a type of attitude and behaviour likely to arouse the gravest misgivings regarding the future of relations between the community and the CER. (18)

Clarity of objectives. The final aspect of the planning phase in this project pattern is the global quality of its objectives. Continuing for a moment, with the CER project, Lallez (19) indicates that, while the plan of operations was fairly clear, the specific objectives of the project were not. It was apparent that the country needed a new type of primary school which would have a rural vocational basis and be linked to village employment and continuing education networks. But a number of important elements were either missing or only partially sketched in: the age of the pupils, the specific relationship between the CER and the primary school, the curriculum (in particular the integration of basic mastery in literacy and numeracy with practical work), the diploma, the precise links to village life.

Specifying such things is, of course, the essence of good planning. It is here that planners and officials can see whether a project is not only materially but also politically, institutionally and culturally feasible. Such an analysis is normally put off until the results of a pilot or small-scale experiment are in, to provide much of the needed information. In this project pattern, however, we find both global objectives and an immediate, large-scale implementation. As shown in the model, the larger the scale of the project, the more reliable the infrastructure needs to be, particularly in the planning phase. In the case of inadequate planning, I + is even more crucial in order to deal with the multitude and gravity of unanticipated problems during the implementation phase. Without I +, the only configuration which can salvage a large-scale project with global objectives would be A + or C + or both. That is, the innovation must either be firmly and durably imposed or, alternatively, be part of a popular 'crusade'. As indicated earlier, none of these configurations characterizes projects of the type discussed here.

There is one strategic reason for this phenomenon: the more global the objectives, the less directed and mobilized the initial resistance. That is, all parties are favourable in principle to a network of rurally-oriented village schools linked to local employment schemes. As Lallez shows, however, they are favourable for different and conflicting reasons, which take shape when the project is implemented. The project thus has the double handicap of not being clear to those who are responsible for carrying it out and not being acceptable to many of those for whom it is designed. A final point which tends to aggravate problems of clarity in project implementation is the tendency to entrust the specification of objectives to outside experts. In the survey responses, outside help was used to define the objectives of the project in 85 per cent of the cases; in only 5 per cent of the cases was this task accomplished entirely by insiders. When questions arise in the execution phase, these experts are often not present, not available or not consulted.

Implementation

In this next, decisive phase of the problem-solving cycle, projects of the first type confront numerous and serious obstacles, many of them wholly unexpected. This has the general effect of slowing down execution or deforming the initial design.

As explained above, when projects are ambitious and the infrastructure is weak, both in the planning and implementation phases, a particular constellation of problems will appear, including insufficiencies and delays; problems of co-ordination, decision making and continuity; problems in social relations. As stated earlier, projects of the type described here typically confront such barriers more often and more seriously than others. In addition, confusion as to what are the specific objectives and resistance at the local level act together to reduce both authority and consensus.

To understand this better it is important to look more closely at some of the typical obstacles encountered in the project pattern:

Insufficiencies in equipment, trained personnel, facilities, funds. This is a common theme in all types of projects, but seems to be a more acute concern in projects of this type since these problems appear almost from the beginning and become increasingly serious independently of the volume of external assistance. Premises are insufficient and not functional; equipment is inadequate; there are too few materials and they are of low quality; the project faces constant delays in deliveries of materials (21). This constellation of problems is, to a great extent, attributable to (a) the haste with which the project was implemented, (b) the overstretching of resources and personnel to service a project for which the plan of operations had overestimated the available resources, and (c) impatience on the part of political and ministerial leaders to show results rapidly.

Resistance (C –). As the project is implemented, opposition crystallizes. On one African rural education project, for example, there was almost immediate resistance from both within and without: school inspectors, mandated to supervise the execution, were not in agreement with the study plan formulated at the ministry with the aid of foreign experts; and local inhabitants perceived the rurally oriented plan to be a cheapening of the primary school curriculum. As shown earlier, projects of this type tend to be minimally negotiated in the design phase, and to be generalized in conformity with a fairly uniform model through administrative rather than informal means (e.g. use of opinion leaders, small meetings, demonstrations). This strategy greatly accelerates the problem-solving cycle, but it very often leads to stiff resistance during implementation.

Lack of requisite knowledge or skills. When an innovation is ambitious in its desire to change behaviours quickly, people are typically put into new roles or situations without adequate preparation. With strong and consistent support from outside (from the administration, leaders of the project or advisers), these people can manage to cope successfully and to acquire the requisite skills on the job. Without this support, there is often a cycle of insecurity, sporadic and unsuccessful attempts to fill the new role, discouragement or cynicism and, finally, a return to the type of teaching or learning performance with which they have had previous success, i.e. the traditional behaviours which the innovation was expected to replace.

To continue with the example of a major rural education project at the primary school level—a common type of innovation in our sample, well-documented in the case study literature and graphically described in the interviews—this problem appears in the following way:

– Teachers are given a new study plan calling for an integration of basic skill mastery in literacy and numeracy with practical exercises to be done either in class or through the experience of cultivating plots of land on the school grounds or elsewhere in the village.

– The study plan is not specific as to *how* this integration can be achieved. There are few materials or examples accompanying the study plan. The teachers may have previously attended a short workshop or training cycle, but it is likely that whatever accompanying materials there might be for the new study plan were not as yet prepared.

– The teachers attempt to design their own exercises or to pool materials among themselves when this is possible. From time to time, they receive a new set of materials, a visit from the inspector or external adviser or a series of radio broadcasts.

– This aid, however, is too sporadic and is insufficient for the task. The teachers become aware that the integration of basic skills with practical work is theoretically appealing but very difficult to achieve. The skills tend to be imperfectly mastered and the practical work artificial. Teachers realize that they have no training as farmers, that the soil on the school grounds is of poor quality, that village inhabitants neither understand nor approve of the teacher's new role as teacher-farmer and that the inspectorate is not firmly convinced of the wisdom of the project.

– The teachers request additional workshops for training and for the development of materials. The ministry is unable to satisfy the request rapidly, since (a) no additional workshops have been planned or funded, (b) the number of teachers concerned is so great that a new training cycle becomes prohibitively expensive, and (c) the project has run into other obstacles which are more threatening in the short run and which mobilize all available energies and resources.

– Teachers begin gradually to return to the conventional study plan. They are further encouraged to do this by the implicit approval of the village inhabitants and inspectorate, but more particularly by the fact that their teaching becomes less difficult, and, equally as important, less threatening to their image of themselves as successful teachers.

We have then the following configuration: lack of adequate preparation → lack of clarity → lack of administrative support → lack of requisite materials and equipment, resulting in a low rate of implementation in the classroom. It is worth noting that such a configuration can be just as familiar in highly industrialized as in developing countries (22, 23).

Weak or inconsistent leadership (A –). Projects of this type, being large-scale, are generally launched and administered from the national or provincial ministry. However, they are launched on such a scale that it becomes very difficult to supervise them, particularly in geographically remote areas and in light of the inadequate infrastructure. Moreover, authority is concentrated in the hands of a few senior administrators who are at the same time far removed from the point of execution and very difficult to contact. This seems to be a more general problem, though, and not limited uniquely to projects of the type being discussed! In the survey responses, 'serious' or 'very/extremely' serious' problems of over-centralization are reported in 31 per cent of the cases, insufficiently clear structure for decision making in 30 per cent and lack of co-ordination in 42 per cent. Lack of good communication with political leaders appears as a 'serious' or 'very/extremely serious' problem in only 20 per cent of the questionnaire responses but it turns up in 64 per cent of the project evaluation reports (the latter being less subject to response bias on such an item).

Turnover of persons and changing administrative structures. As shown earlier, continuity in leadership and reliability in the routines which service an innovation are crucial for success. Projects of this first type appear to be plagued by problems in one or both of these areas. Difficulties in the continuity of leadership can be particularly crippling in that such innovations are typically patronized by the minister and supported by his chief collaborators, many of whom are likely to leave if he does. In our survey sample, departure and replacement of key personnel is more than twice as often observed in large-scale projects (externally funded for at least $300,000 annually) than in those funded for less than $200,000. The relationship between extent of finance and turnover is fairly strong and significant ($C = .40$; $p < .02$). The problem appears more frequently as 'serious' or 'very/extremely serious' in African projects (37 per cent of the cases) than elsewhere (combined means of 21 per cent). This particular problem of governments which change often is also observed quite frequently in the Caribbean and Latin American projects in our survey sample.

In general, turnover of key personnel during the life of a project appears to be a more frequent complaint in developing countries than in the innovatory projects which we have studied in Europe and North America (24,25). This problem appears as 'serious' or 'very/extremely serious' in 29 per cent of the questionnaire responses and 36 per cent of the project evaluation reports. It is considered a key factor in the success or failure in literacy projects studied by Unesco (26). This study reports several instances in which a change of president brought a project to a standstill, or in which constant changes within the ministry compromised execution. There is one extreme example in our sample of project evaluation reports which epitomizes the problem: a restructuring of the ministry of education in which the office through which the ongoing project was co-ordinated came to be eliminated.

Procedural difficulties. Such turnover, of course, exacerbates the procedural difficulties due to I – : insufficient co-ordination, continuity and communication. Leadership is the motor which drives the infrastructure, and continuity in leadership helps to assure that a project is administrated reliably. In this type of project, where the objectives are not sufficiently precise at the outset and where resistance can be expected because of the rapidity of generalization in the phase of project execution, less strength on the leadership dimension (A –) leads directly to a weaker performance of the infrastructure (I –). This in turn discourages those in favour of the innovation and leaves more leeway for those who are opposed (thus intensifying C –).

Personality conflicts. In principle, projects of the 'grandeur' type should not have problems of collaboration amongst those concerned which are different or greater than with other types of innovations. However, two factors may act to modify this situation. First, there is the scale of the projects, which obliges different people and agencies within the country to collaborate where normally each would operate separately in his own realm of influence. Co-ordination between ministries is a common feature in many of these projects, and it is singled out as a frequent trouble spot in the case study literature, questionnaire responses, interviews and project reports. Secondly, the use of large numbers of foreign experts changes the dynamics of collaboration. We shall concentrate our remarks on this second factor.

In the questionnaire, this kind of information is highly sensitive. In point of fact, the responses are less self-censoring than expected. As many as 22 per cent of the respondents report 'serious' or 'very/extremely serious' problems of social harmony and good relations among project team members; 23 per cent signal 'serious' or 'very/extremely serious' problems arising from 'significant differences in cultural values'. Analysis of project evaluation reports, on the other hand, yields unexpectedly high frequencies of 64 per cent for the first problem (social harmony) and 55 per cent for the second (difference in cultural values). Personality conflicts between expatriate advisers and national experts or administrators are apparently common and serious. The interviews concord with this evidence. Respondents cite the good or poor relations between national and international personnel as accounting for the relative success of a project. It would appear, in fact, that the expertise of an external adviser is not exploited (or is politely neglected) if he is not on good social terms with project members, ministry personnel, village leaders or institutional directors. Judging from the interviews, the most successful foreign advisers are diplomats first and specialists later. Their most important function is less that of technician than that of facilitator, unblocking a project by intervening in the ministry or regional administration by means of special status and access to senior officials.

One final point is worth mentioning in this particular context. In the questionnaire responses, there is a slight difference of perception between external advisers and national experts or administrators. Whereas only 15 per cent of the technical advisers note 'serious' problems of personality conflicts, the corresponding figure for the nationals is 32 per cent ($X^2 = 3.4; p<.10$). At first glance, this would suggest a greater insensitivity on the part of the foreign advisers, but other interpretations are also possible. However, if we combine this with information from other sources, notably the interviews, the following pattern begins to take shape.

When foreign expertise is brought in *early* (at the phase of diagnosing needs and devising solutions) and when foreign assistance accounts for a large proportion of the budget in the project, there is a tendency for the foreign expert to identify himself with the project, to see himself as 'responsible' for its success. As a result, he may insist more on the benefits to be derived from his expertise and the importance of his advice. This, in turn, may produce friction between himself and the national personnel. The latter, viewing the experts as aids in the implementation of a *national* project, may perceive the adviser's insistence as arrogance. As a result of such friction, the expert becomes socially unacceptable and thereby inoperative.

Proximate and remote outcomes

It is difficult to find clear evidence of the short-term (proximate) and long-term (remote) outcomes of projects conforming to this pattern. The prediction of our theoretical model—and most of the empirical evidence compiled here appears to support this–is that these projects typically fall short of their initial goals. In particular, they have less long-term impact on the education system of the country as a whole than was hoped at the outset.

One unexpected finding in the survey, however, is the relatively good performance of sub-Saharan African projects on one important criterion of success: the partial or full replacement of external with indigenous personnel and finance. African projects report a 62 per cent rate of replacement of expatriate personnel, compared to a combined mean of 35 per cent for all other regions ($X^2 = 3.4$; $p<.10$). The rate of replacement of outside finance is 43 per cent compared to a combined mean of 35 per cent for all other regions (not significant). To be sure, these percentages are particularly difficult to interpret owing to the obvious danger of response bias (in this case, persons who are evaluating the success of their own projects). There is also the fact that we have not controlled for the duration of the projects nor do we know the terms specified for obtaining UNDP assistance.

The rest of the evidence points to four kinds of outcomes which we shall outline briefly.

Rapid decline when leaders lose interest. The political and educational leadership, discouraged and often exhausted by the number of unforeseen difficulties, turns its attention elsewhere (27, 28). The project thus loses simultaneously high-level support and the special resources which had become its lifeline after the initial years of implementation.

Maintenance at the pilot level. The project is maintained indefinitely at the level of a large 'experimental' programme. The initial goal of generalizing the project beyond a major national centre or a network of institutions–benefiting from exceptional funding, materials and personnel–is abandoned. Finance and staff are gradually transferred from international to national responsibility. Alternatively, external resources are removed and the project virtually disappears, i.e. reverts to the cycle depicted in the preceding paragraph.

Gradual reversion. In many ways, all four outcomes partake of this phenomenon. As stated at the beginning of this chapter, any innovation which cannot be assimilated by the system into which it is introduced–either because it is too complex or too threatening–will be reduced to a level of complexity and novelty which the system *can* assimilate. The strategy of successful innovation entails the *control* of this process in such a way as to be certain that the projected and hoped for level of performance will be ultimately attained. In other words, the objective is to ensure that the system accommodates more to the innovation than the innovation to the system. This control is achieved ideally through the configuration I + A + C + or more realistically through I + A + C –.

In this first type of project, the process of accommodating the system to the innovation is not controlled, so that the surrounding environment gradually swallows up the innovation. To cite two examples from the case study literature:

> There is also an increasing tendency for the nonformal programs, partially in response to parental expectations, to take on the features of formal institutions in content, method and goal. The overall socio-economic structure and the system of incentives reinforce this tendency. Thus, the youth center tends to become a substitute primary school and the VP an ill-equipped vocational school. (29)

> It is further to be noted, for the importance of the fact is immediately apparent, that there is a strong tendency to reproduce in the centres, especially for literacy work and the acquisition of basic intellectual mechanisms, the teaching approach in use in the primary schools. (30)

This phenomenon also occurs when a project is kept permanently at the pilot level since these experiments become increasingly less aggressive in their policy of diffusion to surrounding institutions.

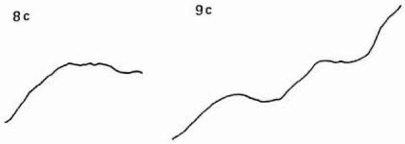
The 'phoenix phenomenon'. There is some indication that a major innovation, for example in functional literacy or vocational training for unskilled adolescents, can have a long-term effect in the right direction but not in the manner foreseen in the initial design. The large-scale, 'showcase' project tends to disappear, but the idea is picked up on the local level by a village leader, provincial administrator or school inspector. A small-scale, locally initiated project is designed and executed with success. The experiment then attracts more attention at the provincial or national level—and we have a new problem-solving cycle. However, there is a good chance that the initial history of the project will not be repeated. On the one hand, there is now an experiment (i.e. a field test, albeit an unintentional one) on which to base a new plan. On the other hand, the memory of the original, unsuccessful design, may serve to render the new objectives less grandiose.

PROJECT PATTERN 2: CONTROLLED EXPANSION

We have dealt in some detail with the first project pattern both because it is familiar (especially in technical assistance projects) and because it allows us to concretize the theoretical model. In particular, we are able to highlight the difficulties, as well as the sources of these difficulties, inherent in bringing about rapid and massive changes in education when many of the requisite conditions for successful innovation are not met.

The growth gradient of the second type of project corresponds to figure 8c or 9c of the preceding chapter, as reproduced below. There is a fairly rapid rise, followed by a levelling off, and, later, a gradual decline. Alternatively, there can be a gradual rise with moments of stabilization and regression.

FIGURE 24.



Antecedent conditions

The situation here is different from that of the first project type, although there exist equally numerous and urgent needs in the education sector. These needs are attributable to the following factors: the low productivity of formal schooling in relation to its cost, the continuing influence of the colonial education system, the unfulfilled demands for middle-level technicians, high rates of illiteracy and the underdeveloped state of the entire adult education network. However, although the perceived urgency of these needs may be equally strong in the two types of project, the expectation that these needs can be met rapidly or through a massive effort at reform, is less strong in this second type. On the one hand, political independence appears to have been achieved earlier; on the other, the political élite is less mobilized, i.e. there is less consensus on the type and degree of change required. Nor does popular sentiment appear to be galvanized as much as in the first project type. The overall impression is that of counterbalancing political forces, scepticism as to the possibilities of an overall solution and, possibly, the realization that the colonial education system is more difficult to shed than was first thought possible. This system has, after all, been the training grounds for the educational leadership, the sole frame of reference for teachers and parents, and it continues to dominate in its requirements for advanced studies and diplomas.

Problems of internal finance (low growth in GNP and in per capita income, unfavourable balance of payments) appear to be as acute as in the first project type, although this can vary widely among the countries for the projects we are now describing. The consequences of insufficient internal finance are the same as in the first type: inability to summon needed resources in moments of crisis in the project and heavy reliance on external assistance.

Lower level of permeability. In this pattern, a lower level of expectation is accompanied by a corresponding lower level of openness to new inputs. One index here is that political and educational officials are older. Another is the frequent characterization of the social and cultural systems as 'highly traditional'. Summarizing from the case study literature, interviews and project evaluation reports, one may conclude that this global profile fits most closely a number of Asian projects. If we look at the survey results, keeping in mind that the group of Asian projects is smaller (N = 16, or 20 per cent of the sample) than the African group (N = 42, or 52 per cent of the sample), the above analysis holds up. Opposition to change on the part of the political and educational élite is somewhat higher in the Asian projects than elsewhere (observed in 63 per cent of the cases here, compared to a combined mean of 43 per cent for all other regions). The inappropriateness of the colonial education system is mentioned significantly less often as a serious problem by Asian project respondents (33 per cent) than by African project respondents (82 per cent, with $X^2 = 12.8; p<.001$).

Assessment of needs, design and planning of solutions

As in the first project type, the planning cycle appears to be rapid and exclusively quantitative. There is even a suggestion in the case study literature that these projects have less reliable pre-planning data than do those of the first type. This renders quantitative planning all the more hazardous.

The survey responses show, in fact, comparatively less importance attached to careful and comprehensive planning among respondents from Asian projects. The following five items constitute a strategy of rigorous planning and systematic application:

- clear definition of objectives
- careful and specific planning in detail
- use of research; systematic retrieval of information
- evaluation in quantitative terms
- organized sub-groups or sub-systems for research, planning, materials development, dissemination, etc.

This strategy is given a high or extreme emphasis by 31 per cent of the Asian project respondents. The remaining 69 per cent characterize their projects as attaching moderate or little importance to such an approach. By contrast, a high or extreme emphasis is placed on this strategy by 69 per cent of the respondents from other regions (combined mean). These differences are significant ($x^2 = 8.6$; $p<.01$).

As might be expected from the analysis of antecedent conditions, the solutions devised (that is, the form and scope of the innovation) are less ambitious than in the first project type. Heavily technological solutions are either ruled out or accepted with a very gradual rate of development. There are indications that the educational leadership may be more experienced and more cautious and unwilling to launch a major project which cannot be fully controlled. When large-scale projects are designed, they tend to be additions to the present structures (increase in the number of teacher training institutions or vocational training programmes, etc.) in the sense of EL + rather than radical changes in the roles of the target public (thus meaning BC –).

As in the first project type, there is an early and significant role of outside finance and expertise, played in much the same way and concluding in a similar format or design. The final plan of operations calls for a moderately large project involving strong outside assistance but not constituting a radical change in the educational system of the country. The feasibility of the project has been determined not so much on the basis of a careful assessment of available resources and administrative or local support, as on the appraisal of senior ministry officials, aided by external advisers.

Unlike the first type of project, implementation here does not appear to be accompanied by a large-scale campaign to publicize and gain support for the innovation. Both project types do, however, share two characteristics: the vague or global nature of the project objectives and the highly administrative mode of implementation. Here again, projects do not appear to have been seriously negotiated in advance at the local level. Rather, they are entrusted for execution to provincial officials. Nor are techniques of 'social interaction' (use of opinion leaders, local media or of specialized agents hired to speak for the project) used to increase the rate of implementation or, at the least, to reduce uninformed opposition.

When needs are diagnosed at the central ministry, solutions sought that entail a generalized model of execution, external experts brought in for planning and project design, and few negotiations carried on with potential users, then several problems arise. It is likely that the innovation will be difficult to apply in any setting other than a newly created national centre or institute. This is not because of the specific likelihood of resistance at the various local sites since implementation is on a more moderate scale and a lower gradient of behavioural change is required of the users. The dilemma lies rather in the distance between the point of conception and the locus of application, and it is aggravated by an optimistic belief in the viability of uniform solutions to complex problems. Both this and the previous type of project show the tendency to look for rational, cost-effective, easily administered and easily supervised solutions to a problem. Such solutions are found to be ingenious and apparently practicable by the initiating central authorities and experts but they are judged artificial or wasteful subsequently at the site of implementation. Ahmed illustrates this dilemma in his commentary on an Asian vocational training project (MTTS project) that corresponds to this second type:

> Relationship with Indigenous Training. There is no evidence that the program has been planned to take into account the already existing, indigenous ways of skill development. The courses taught to girls and women will illustrate the point. Many of the women clients of the program presumably come to it to learn homemaking skills, although a certain proportion use their training to earn an income. The low private cost (to the trainee) for the courses undoubtedly makes the program attractive to the girls. (This may also be true for the boys.) While the desirability of teaching girls how to be better homemakers is not disputed, no society is without a traditional mode of preparing its future wives and mothers. The investigators believe that the program is not cognizant

> of what existing traditional skill training the MTTS courses are supplementing, reinforcing, modifying, or replacing, or what the loss would have been if there were no MTTS course. One indication of failure to recognize traditional skill training opportunities is the program's insistence on using instructors with formal teacher training rather than local craftsmen and skilled workers...
> ...The unanswered question is whether able practitioners of specific trades in the locality, but without 14 years of formal education, might be used on a part-time basis to teach their respective trades – possibly after a brief pedagogical orientation. These people could be less expensive than a full-time civil servant who must be offered extra financial inducement to leave Bangkok. It might well be that such master craftsmen and skilled workers would make the courses more practice-oriented, more flexible in content, and more relevant to local needs. (31)

The basic axiom which is operative here – that people change less easily when the change does not help them solve problems that are real to them – is presented in the Rand Corporation review of recent American innovations in education:

> Our field experience implied that although categorical, targeted programs may be intrinsically more satisfying to the federal policymaker concerned about the national dimensions of a problem, it is unlikely that these programs will lead to much change unless the program's aims fit local interests and priorities.
>
> Our experience suggested that where local and national priorities are not congruent (as in some of the career education and Right-To-Read programs), federal intent is likely to be subverted to local interests, local administrators will simply take advantage of available opportunities, and the project will probably have little or no long-term impact. (32)

Implementation

In the implementation phase, the list of expected and unexpected difficulties is similar to that of the projects in the first category. However, differences in the interaction between such difficulties and the threshold at which they become grave lead to different patterns. These differences in pattern are due to (a) the relatively smaller size of these projects (in amounts of funds and personnel), (b) their lower level of ambition (BC –), (c) a slightly more reliable infrastructure and (d) a more consistent structure of authority (A +). This, in turn, leads to the following profile:

Resistance. As noted above, the lower levels of behavioural change expected of the users lowers resistance. These projects typically involve *adding* new elements to the existing system, whether in a village, institution or training programme; these new elements are then entrusted to a small number of selected and qualified persons. The MTTS project cited above is an example. There is also some indication that those who are required by the objectives of the innovation to try out new roles may do so while making fewer demands on themselves and on others; this is the reverse of the situation in the first project type. There is less urgency here, and less expectation of immediate success. Implementation in the classroom or at the training site may be more mechanical or perfunctory.

Inadequacies of materials, manpower and facilities are typical problems, and they result in delays, poor implementation and the use of traditional – and therefore often inappropriate – materials to replace the new materials which have not been delivered on time or in sufficient quantity. Here again, it would appear that the needed resources have been underestimated in the planning phase. As a consequence, they are spread too thinly among the users. The problem is slightly less acute here than in the first project type since the scale of the project is smaller and a special effort has been made to secure materials and equipment from sources of external aid. The case studies and interviews also give the impression that these inadequacies are dealt with more philosophically, and that a less rapid or effective degree of execution is better tolerated.

The *lack of requisite skills and capabilities* to implement the project as planned is present here as it is in all four project types. Changes in performance and behaviour, particularly in the case of teachers and adult learners, cannot be assured simply by making situational or administrative changes (33). Adults, in particular, require a relatively long period of (a) observing others in the new roles they will later have to assume, (b) trying out these new behaviours in an unthreatening environment, and (c) having access to advice and needed materials in the initial period of actual performance. Without such help, there will be passive or active resistance. This resistance, in the case of adult learners, will be more difficult to prevent than it would be with children, who are more easily supervised and more readily forced to perform new roles. Such help is not available in most of the innovations studied in this book. The problem is more serious in the first project type, since the expectations for new behaviours are so great. In the second type (with BC –) there is less distance between what a teacher or learner can do at the outset and the new skills expected of him.

Authority in this type of project remains fairly strong (A +), but it does suffer from many of the problems of overcentralization mentioned in the first project type. Here, however, governments appear to be more stable. If we use our sample of Asian projects in the survey as a reference, government instability is observed in only 15 per cent of the cases, and in *no case* is it judged 'serious' or 'very/extremely serious'. These responses can be compared to those governing the African projects, where the problem of changing governments was observed in 43 per cent of the cases. Of these cases, 64 per cent are judged 'serious' or 'very/extremely serious'.

All the *procedural difficulties* associated with a weak infrastructure appear in these projects: poor co-ordination, communication and delegation of authority and a number of resulting delays or confusion. In particular, there appears to be little attempt to monitor the project in a systematic way in order to diagnose its weak points and remedy them before they compromise the succeeding phase of execution. Using as an index the responses to questions on project evalution in the survey, we see that 'systematic data collection' is used in 18 per cent of the Asian cases in our sample, as compared with 59 per cent of the African cases and a combined mean of 56 per cent for all other regions.

Yet implementation does appear to be achieved with fewer ups and downs than in the first project type. There is an indication of fewer unexpected outcomes and of a more rapid return to normal when they do occur. This may be a function of the lower level of ambition in these projects, but it can also be attributed to more consistent authority and to a more entrenched *routine* for executing projects through administrative channels. In terms of our paradigm I is not as low as in the 'alternative of grandeur' and A is higher, which increases the probability of smoother execution.

The over-all impression is that of a more formalist and regulated implementation of the innovation. There is little improvization or risk-taking. The people and administrative structures connected with the project do not *adapt* to new situations as much as they *apply* existing rules to them. This reduces the confusion, aberrations and uncertainties which come up in any innovative project, since an answer, decision or regulation is usually available. However, it also limits the project's ability to adapt to new situations or to allow local variants and thereby lowers its chances of being durably adopted. Furthermore, since many new projects are assimilated to conventional, ongoing programmes which are subject to the same authority structure and manual of regulations, this also acts to reduce the degree of actual change.

This project type emerges in a recognizable but far less clearly defined form in the case study literature, project reports and interviews than did the 'alternative of grandeur'. In the survey data, there are two items for which the responses support our pattern. Asian projects report a problem of 'too many rules and regulations' only slightly more than other regions (38 per cent of the Asian respondents, as compared to 27 per cent for African projects and a combined international mean of 27 per cent). The Asian projects, however, report significantly more serious problems with 'people in key roles not being open to change their attitudes or behaviour'. The percentages of Asian and non-Asian projects on this item are 75 per cent and 18 per cent respectively, a highly significant difference ($x^2 = 6{,}7$; $p < .01$). This agrees with information from other sources indicating that there is frequently an attempt in this type of project, on the part of external experts and agencies, to bypass the official administration in executing the project. Results appear to be unsuccessful for the most part, as might be predicted from the hierarchical nature of authority (A +) and the more rule-bound infrastructure. The most effective experts in this kind of situation seem to be those who know how to 'work in the interstices' where regulations are less explicit.

Outcomes

As indicated by the growth gradient, projects of this type tend either (a) to stabilize and then to decline very gradually or (b) to stabilize with a slight enlargement year by year – a very slow-motion S curve. In relation to the four outcomes described for the first project type, these projects are most likely to be maintained at the pilot level or be subject to gradual reversion. However, there is a new outcome which appears in several cases: that of a gradual expansion.

In this regard, the questionnaire responses for Asian projects show that the degree of partial and total replacement of external finance and personnel is 31 per cent and 32 per cent respectively. Both figures are lower than the combined mean for all other regions. This would tend to support the idea that such projects tend to remain as model or pilot experiments supported by a relatively higher level of funding and staffing (including external) than other institutions or programmes in the country. Other sources, however, indicate that these projects do sometimes take root, although very gradually, and are slowly diffused to other settings. To some extent this process of diffusion is more administrative than organic; it comes about through administrative fiat (A +) as the innovation becomes itself the new norm. Yet adoption appears to be durable in this form, although far less widespread than was foreseen in the initial project design.

PROJECT PATTERN 3: THE CRUSADE

The appropriate growth gradient here is 8b or 8c, as illustrated in Figure 25. This shows a very rapid, sustained rate of change, followed by a levelling off. As indicated earlier, these are unusual projects requiring exceptional political conditions and about which it is very difficult to acquire unbiased information.

Our earlier mention of such projects depicted them as 'crusades': projects led by a charismatic authority figure, enjoying widespread public support and profiting from an administrative infrastructure which, although uneven, contains good linkage between national and local levels of execution. The 'doctrine' or policy behind these projects is

FIGURE 25.

strongly socialist or collectivist, and the strategy of execution emphasizes self-help rather than external assistance.

Antecedent conditions

Many of the conditions present in the first project type are also found here: for example, immense and urgent educational needs, desire for and consensus on sweeping changes both in the formal and out-of-school networks in order to overcome a dysfunctional colonial heritage. In some cases, independence is recent and leaders relatively young; in others, independence is less recent and the élite is older. In the second case, moreover, those presently in power are the same as those in power directly following independence. The political leadership tends to be powerful, charismatic and well surrounded by a stable corps of advisers and ministers.

Problems of internal finance are acute, but two important features modify the impact of such problems in this project type. First, the type of project selected for execution may not require a heavy financial outlay; then, if it does, there is a tendency to use whatever national resources are available, rather than to turn to extensive outside assistance. This is often done by borrowing funds, equipment and personnel from another sector judged of lower national priority. This option is reflected in the survey results in the following way: respondents who describe the strategy of innovation as having an 'extreme' emphasis on self-help are less likely to feel that inadequate inside finance 'constituted a serious problem'. An emphasis on self-help, we may recall, means that weight is placed in particular on the following characteristics:

- belief that people ought to be able to solve their own problems with minimum outside interference or assistance
- maximum use of local resources
- local control, participation and decision-making
- responsiveness to local needs, customs, desires
- wide latitude for individual initiative and choice at the local level.

Analysis of the responses shows that in only 33 per cent of the cases where an extreme emphasis was placed on a strategy of self-help were there also serious problems of inadequate internal finance. Although there would seem to be clearly fewer problems of internal finance with an extreme emphasis on self-help, crossbreak analysis yields only a moderate and statistically non-significant relationship between responses on these two items ($C = .19; p<.20$).

In the phase of *assessing needs and devising appropriate solutions*, the profile in this project type is unusual. In one sense, the planning cycle appears to be rapid and improvised. There is little or no 'objective' assessment of needs, nor is there a careful definition of the problems, nor even a weighing of alternative solutions to these problems on the basis of pre-planning data. The plan of operations tends to be approximate or indicative. The fact that external expertise is not present in this phase to reinforce the importance of comprehensive planning may also account in part for the form which the planning cycle takes.

Yet, this exercise appears to satisfy the political leadership, who seem to reason as follows: with open and frequently used channels of communication to provincial and local leaders, the real needs will be registered in an undiluted form. This mechanism can replace a more comprehensive, quantifiable approach to information gathering and avoid the limitations of passing through intermediaries and of being translated into a message which is less situation specific. The problems can be defined in all their complexity by people who are themselves close to the local setting or at least in direct contact with others who are. The inventory of resources is likely to be inexact and incomplete, but the type of solution devised should be such that it calls for—even relies on—volunteers and donations of materials or facilities in the region of execution. The long-term implications of this particular project and its relation to other needs and priorities are weighed intuitively by political and educational officials.

Finally, there is the awareness, if not the certainty, that such a large-scale innovation is bound to run into many unexpected difficulties as it is being implemented, and little attempt is made to anticipate them. Here again the reasoning is simple: if the need is genuine and the solution appropriate, people will adapt to new and unexpected situations, provided that leadership and administrative support are strong and consistent.

As appealing as this conception may be, it is a high-risk strategy for defining needs in education and training and converting those needs into major projects. In many ways, the first type of project makes very similar calculations both in the way in which the information on needs is to be gathered and in the assumptions as to how problems encountered during execution are to be solved. These calculations, as shown earlier, were largely incorrect. It is generally *because* these kinds of assumptions often prove to be erroneous that comprehensive planning is undertaken in the first place, in order to reduce the margin of error. To be sure, when the field of action is *limited*—when for example, we are dealing with a training project in one or two villages or in a small city precinct—there is less need for comprehensive planning since the necessary data are usually at hand or can be readily obtained. Innovators in local or small-scale projects can correctly diagnose the situation by living in it or by observing it. This enables them to predict accurately when a solution will be both practicable and acceptable. At the *national level*, however, this kind of diagnosis is almost impossible, and the errors in judgement are more serious in the light of the large scale of the project.

The 'crusade' project type is unusual in this respect: it relies on an apparently intuitive and informal mechanism for planning on the national level, which appears to lead to success in the projects which we have analysed. This means that a well-conceived, informal approach to diagnosing needs can be both sensitive and reliable (the needs which are diagnosed are genuine). It also means that when the diagnosis of needs is sensitive and reliable, the assumption that improvisation at local sites of execution can replace more comprehensive planning of operations can be a *correct* one.

Design of a solution. Usually the solution devised calls for a large-scale innovation, both in the sense of BC + and EL +, although, in some cases, the configuration is BC + EL −. In the initial phase, technology plays a minor role. If it is used, there are also adequate means for responding to and correcting the programme; the Colombian ACPO project is a good example of this. In general, however, these projects tend to be very much centred on people. Adult literacy, vocational training centres, rural education programmes: all appear to involve the mobilization of learners around a core of instructors. Both groups are often literally 'mobile'–learners coming for short periods of time to centres and instructors circulating locally in teams–thus limiting the need for creating large, centralized institutions. There are often great numbers of people to coordinate in a variety of local settings, and this appears to be done through strong administrative direction and the widespread use of local leadership, facilities and expertise. This is a configuration which can only succeed (a) through complex programming and an elaborate, highly reliable infrastructure (to treat the number and variety of messages and connexions) or alternatively (b) through extremely strong leadership and equally powerful motivation on the part of the users. It is this second alternative which makes for the success of such 'crusades'.

External finance and expertise are not always absent in this project pattern, but if they come, they appear later in the problem-solving cycle and in less intensive amounts. As a rule, it is only when a solution has been found–once the overall objectives and the basic design for execution have been defined–that external assistance is sought. This entails (a) less risk of an international rather than a national solution to the educational needs of the country, (b) a greater emphasis on local resources which are more dependable, more acceptable to the users and better integrated into the training network, and (c) less likelihood of the country's becoming dependent on external agencies in subsequent phases of the project. The practice is to bring in small numbers of external specialists or technicians for precise tasks which have been defined in advance. In this way, the foreign expert does not identify as closely with the project, but views himself as a temporary and expendable resource. This, in turn, decreases the likelihood of conflict between nationals and internationals within the project team.

One further point on this subject: the survey results indicate that the amounts of foreign assistance may be related to a potential for greater conflict at the point of implementation. In projects funded externally at a mean annual amount of \$200,000 or less, there was 'consensus on the objectives of the project' among participating parties in 82 per cent of the cases. For external funding at or over \$300,000 annually, consensus was reached in only 56 per cent of the cases. It must be noted, however, that the correlation between amount of outside funding and consensus is statistically modest ($C = .24; p < .20$).

As could be expected, the *final plan of operations* is neither precise nor detailed. Rather different operations within the project are entrusted to ministry or provincial officials. The latter are expected to negotiate means of implementation at their level or with local leaders. As a result, the project is likely to be highly decentralized with coordination assured by these officials. To give an example, if literacy materials are to be used, a set of prototype materials is sent to the provincial or local level. These materials are meant to be adapted to local settings or may even be put aside if judged inappropriate.

The interrelations between several aspects of the plan of operations are interesting to note. First, execution is meant to be rapid and widespread. To facilitate this, political and educational leaders may undertake a tour of implementation sites in order to generate support for the project. At the same time, the plans call for more informal means of influence, what we have called the 'social interaction' strategy of innovation. Village leaders and influential 'opinion leaders' are contacted. Local sites and means of communication (cafés, markets, fairs, radio broadcasts in local dialects, etc.) are used to stimulate interest and participation or, alternatively, to reduce resistance and anxiety. Special agents may be hired to circulate and inform people of a new project, often by demonstrating its advantages in some tangible way.

To judge from the survey responses and interviews, these techniques of informal, social persuasion are not used extensively in large-scale projects in developing countries. This makes the 'crusade' an exceptional case. Apparently, such techniques are judged elsewhere to be less rapid and reliable than a purely administrative form of implementation. Or else, it may be (correctly) perceived that informal local leaders are opposed to the innovation. Very often, in fact, these two phenomena are related, i.e., the perception that local leaders will oppose the project and a purely administrative or coercive form of execution.

The survey responses highlight the relationship between the use of these informal techniques and the origin of the innovation. When the originators are from within the country, the use of opinion leaders tends to be frequent, and to play an important role in the strategy of innovation. When the originators of the innovation are external advisers or a combination of national and international expertise, these channels are less likely to be used. The correlation between inside origin and extensive use of opinion leaders–typical of the 'crusade' project–is moderately strong and significant ($C = .36$; $p < .001$). We note here once again the link between outside aid during the conception of a project and an option for more administrative, uniform modes of execution.

Finally, this plan of operations addresses itself rather successfully to the crucial problem of BC +. By accentuating the presence of strong leadership, by mobilizing informal opinion and by creating an atmosphere of national crusade, there is an attempt to encourage people to attend programmes, try out practices or accept instruction of a type with which they are unfamiliar, and toward which they feel unprepared and, very likely, anxious. It would appear that this strategy is initially successful. That is, the target public in this type of project appears ready to take a number of personal and social risks which it would normally have refused or avoided.

Implementation

As mentioned earlier, numerous and serious problems are encountered during implementation of the innovation, many of which are unanticipated. The project confronts these obstacles effectively for the most part, by adapting rapidly to new situations. Strong leadership (A +) which calls upon the doctrine supporting the project is able to maintain enthusiasm and self-sacrifice. The particular importance of the doctrine is stressed by Brumberg in the ICED assessment of the Colombian ACPO project:

> In a mass education program that seeks to treat the 'whole man,' a clear ideological stance is important. It lends cohesion to the program, serves to establish clear objectives, and lends authenticity to spiritual and motivational messages. ACPO has fostered a developmental mystique among its workers and its audience, and evidence suggests that this has resulted in greater dedication among staff within the organization and a considerable degree of voluntary action on the part of campesinos. (34)

Insufficiences in equipment, materials, trained personnel and facilities are all encountered, but without seeming to incapacitate the project. As hoped, local and provincial officials quickly respond to these problems by making available facilities, equipment and, often, funds. Personnel work overtime and recruit volunteers as aides. A good deal of improvisation goes on at the training sites. It is worth noting that such improvisation is more difficult when projects are trying to use more sophisticated or externally acquired materials.

Resistance appears to be absent at first, but makes itself felt as teachers, trainees and volunteers confront the first difficulties of learning a new skill or dealing differently with their crops, children, classrooms or village customs. Here again, the basic problem is not deliberate opposition but rather the *lack of requisite knowledge and skills* to perform these new roles. However, the conditions are present to help diminish the anxiety or anticipation of failure: the motivating force of the doctrine, the easier and less judgemental contact with other trainees and with instructors, and the latitude to find one's own particular way of learning or teaching the new skills. But the lack of previous training, combined with the pressure for rapid change, may lead to more defensiveness than is often admitted by those running these projects. There may be superficial or temporary change in behaviours, with a later reversion to the prior (secure, successful) performance in unsupervised moments or at the end of a given training cycle.

Leadership. Because in a crusade, disagreements with the innovation and its objectives are unacceptable, local foot-dragging and subtle forms of sabotage are not likely. People generally strive to meet the high standards of performance expected. Leadership must therefore be both *inspiring* and *demanding*. These projects appear to have A + at all levels–institutional, local, provincial, national–with each level in close communication with the others. This control function is further strengthened by high consensus on the objectives of the project. Authority figures come to symbolize the consensus, which in turn facilitates implementation and decreases deviance. As a result, teachers and trainees are obliged to try out new roles for a fairly extensive period, which in turn makes the new behaviours more stable and more difficult to extinguish later. The probability of achieving BC + is thereby greater for a greater number of persons affected by the innovation.

Turnover. There appears to be little turnover of key persons associated with this type of project, and little or no change at the ministerial or political levels. This facilitates continuity, including communication with and support from above. One of the most frequent complaints in projects of the first and second types is that political leaders lose interest in the project once it is launched and are difficult to contact thereafter when serious problems come up requiring high-level intervention. 'Crusades' are less prone to this difficulty. We have already observed the relationship between problems due to lack of interest by and good communication with political leaders on the one hand and inadequate inside financing on the other. With 'crusades', however, there is no lack of interest and there is good communication with political leaders; inadequate inside financing is not an acute problem either. In the survey responses, the correlation between adequate inside financing and an absence of serious problems of sustaining the interest of or maintaining good communication with political leaders is, respectively, .28 ($p<.02$) and .38 ($p<.001$). This point is underscored in the Unesco evaluation of a Tanzanian functional literacy project–an innovation which would correspond to this project type:

> The administrative shift could not have been accomplished without the high-level government support for the project which existed; the fact that the project *was* capable of responding effectively to the administrative problem, and to a number of other problems which developed during its duration, demonstrates the importance of high-level government commitment for success. (35)

There are, nonetheless, *problems of co-ordination, delays, confusion and too rapid implementation* which indicate that the scale of the project (EL +) is often too great for the infrastructure. With few established routines or regulations to guide decision making, much time may be lost in discussion of each problem, with bottlenecks being created at the level of local and provincial officials. What is particularly difficult in this type of project is the co-ordination between national or ministerial demands and local situations, so that there can be frequent phases of over-centralization or over-decentralization, both of which inhibit smooth execution. Here again, the difficult moments are surmounted by means of strong leadership and appeals to the social doctrine underlying the project. These generally call forth the necessary patience or expenditure of energy.

Proximate and remote outcomes

We have noted the difficulty of obtaining reliable information on short-term and long-term outcomes in this type of project. One possible reason for this is the strength of the self-help doctrine which tends to make shortcomings harder to admit to outside evaluators.

One of the survey results may be indirectly pertinent here. Replacement of external finance and personnel is partly or fully implemented in 51 per cent (finance) and 56 per cent (personnel) of the cases in which *the originators of the project are insiders* rather than outsiders or a combination of the two. With outside originators, the rate of replacement is only 8 per cent for finance and 31 per cent for personnel. The correlation between origin and replacement is .32 ($p<01$) for finance and .20 ($p<.20$) for personnel. To be sure, these projects typically use lower levels of external finance and personnel than do those of the first and second types, but the rate of replacement is nonetheless markedly higher. Clearly, inside origin leads to a stronger commitment and increases the likelihood that the project will continue after external aid is withdrawn.

The key question in relation to these projects is whether the initial rate of change is maintained over time or whether there are subsequent periods of stabilization or even decline. We suspect the latter to be the case. On the one hand, it is very difficult to maintain an atmosphere of crusade or even to continue to devote large amounts of political and administrative time to an innovation over long periods, no matter how large its scale or high its priority. On the other hand, the degree of change expected in the functioning of local institutions and in the behaviours of teachers and trainees is so great that the surrounding social and political systems are very likely to protect their 'systemic integrity' by absorbing many of the changes in such a way as to reduce the gradient. We would anticipate a fairly high rate of reversion to the colonial or traditional ways of teaching, learning, planting, interacting with one's children or neighbours, etc. This, however, does not preclude continuation of the innovation under normal conditions nor even a greater rate of diffusion to other settings than was found in the first two project patterns.

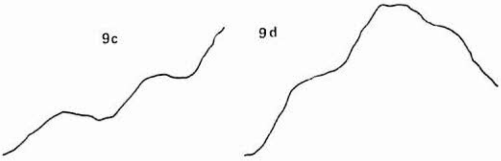
PROJECT TYPE 4: SMALL-SCALE AND LOCAL CHANGE

The final project type involves small-scale innovations, in the sense of EL – and BC –, but they may be of various origins:

- locally originated with no governmental or external intervention
- locally originated with very little governmental or external intervention
- originated at the provincial, ministerial or even international level, with the objective of gradual diffusion at the local level.

Whatever their origins, projects of this type appear to be effective, although the rate of change is very slow. Unfortunately, however, the rate is often slower than many innovators or ministry officials can tolerate. This impatience results in the adoption of a strategy similar to that used with projects of the first or, less often, the third project type. Yet in this last type it also seems at times for the innovators that the great number of problems confronted during implementation are disproportionate to the limited objectives, i.e., that too little is to be gained for so much time and effort. This leads to many of the projects being discontinued. Consequently, the typical growth gradients are very different for those who persevere and for those who lose their 'élan'.

FIGURE 26.



Antecedent conditions

Although the needs are great and the innovators sense an urgency in finding solutions for them, it is not possible to launch a large-scale or BC + project. Either the resources are lacking, or the strategy of diffusion involves gradual implementation in a number of local sites, or else the politics and interpersonal dynamics of rural life make it impossible to move quickly or on a large scale. Again, there is the possibility that the project is 'subversive' to ministerial and governmental interests and must be implemented slowly and carefully so as not to attract attention while building a firm base for later expansion.

As we remarked earlier in this chapter, there is considerable resistance to change at the village or local level. This enables the inhabitants to protect themselves from outside pressures, and to ensure greater equality between groups within the village. In this way one group must negotiate an innovation with the others, thus limiting the degree of change relative to the *status quo*. When we say that, at the local level, people are more traditional or conservative, we can only partially explain this by means of a clinical analysis of their personality structure or be mentioning their lack of contact with other, more stimulating or varied environments. It is also important to point out that the energies of such people are socially in equilibrium. A great deal of energy does not get channelled in any one direction without meeting with energies moving the other way. As we saw in the third project type, when these energies *are* successfully mobilized in *one* direction, there is rapid and effective change.

The key element here is building from needs or problems which are real and urgent at the local level. This may be a banality, but many projects have foundered for not having observed it, and projects of this type are also likely to fail if they are not closely linked to locally developed solutions, to locally identified needs.

At the origin of these projects, then, is a generally acknowledged need. For example, there is widespread unemployment and the government plans to stimulate local industry in a province where many potential workers are not trained in the requisite skills; or there is the threat of famine which calls for a new technique of accelerating crop production. There can be more modest but equally real problems: for example, the lack of materials at schools, necessitating the development of primers, writing materials and tests for the children. In the case of locally initiated change, the 'innovators' – the persons who articulate the need and/or design and negotiate the solution – resemble the classic portrait in the literature on change: someone who is relatively younger and more educated than the mean, who has lived for less time in the local setting or has spent several periods outside of it, and who keeps in contact with 'cosmopolitan' persons or sources of information, etc. In one very interesting, succcessful example, a Panamanian vocational training project, the innovator had participated in a regional Unesco training workshop and used the resulting skills and information to develop a much needed small-scale project in his district. The project was, in fact, extended to a wider audience at a later stage with governmental and external assistance.

When, on the other hand, the innovation is not initiated at the local level, it is not obvious that the need will be perceived as real or urgent within the local setting. Rather, someone else has diagnosed a need and, very likely, devised a solution which he tries to introduce within the village or institution. In projects of this fourth type, the solution is introduced slowly, through the intermediary of local officials or opinion leaders, using local media (newspapers, word of mouth, games) and local meeting sites (cafés, markets, festivals) to communicate and even try out the innovation. The strategy is often deliberately manipulative* but its effectiveness is dependent on whether or not the solution is a meaningful response to local needs. If not, it will be discarded or assimilated into the village institution in such a way as to preserve the *status quo*. Here, with a strategy of A − C +, it is the pertinence of the innovation which matters, since trial and adoption are not being imposed through A +.

Planning and designing the innovation

In a project of this type, and when the origins are internal, needs assessment and problem definition are rapidly done. The optimal solution is also easily found, but it is often impracticable or inacceptable. *Impracticable* in that the local setting has almost none of the requisite trained personnel, materials, equipment, facilities or necessary funds. The innovators often seek external assistance in vain, since the project tends either to have too little visibility or too low a priority on a provincial or national agenda. There may also be some difficulty in identifying and contacting these external sources of aid. Our evidence indicates that this is where the role of the village leader of provincial official is crucial. If this leader of official is the innovator, there is likely to be some higher-level financial and administrative assistance which will help the project through both its initial and critical phases. If he supports the innovation but is unable or unwilling to get additional aid, implementation is likely to be slower and more arduous. If he opposes the solution proposed, there is little chance of a successful implementation. In this last case, either a new, more acceptable solution is found or else the project is so reduced in scope that local or provincial officials may not hear about it or, if they do, they pay no heed until an attempt is made to expand it – at which time a new planning cycle takes place. The solution may be *inacceptable* in that some people in the village, institution or programme stand to lose influence or prestige, or are unwilling to expose their problems to others. This is part of the slow, tiring process of negotiating a solution which is acceptable without compromising the thrust of the project.

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* Many writers tend to blur this point. We have noted a recent trend towards cultural purity in the writing on innovation, but it is often used in a misleading, contradictory way. The central message appears to be that local culture must be preserved and protected from alien interventions, but there is another veiled message underneath, to the effect that progress must go on, local environments must adapt to changing conditions, etc. On this premise one can justify the subtle 'reshaping' of local customs and media from without, providing it is done 'in a sensitive manner'. This is simply another, more sophisticated way of telling people that others know what is best for them, the proof being that the remedy will only cause a little bit of discomfort at any one time. The option of refusing the remedy – or innovation – is not open, but the type and dosage of medicine is negotiable. Here is a typical justification of this strategy applied to an innovation in Indonesia:

> "Development should be a natural outgrowth from existing institutions. It should be an *internal mobilization and reshaping of existing cultural resources rather than an injection of alien elements*. Broad-based and highly credible elements of culture should be employed for development messages. Placed in a structural functional framework, *existing cultural structures must be identified, mobilized and utilized to carry out development messages through the subtle modification of their function.*" [N.J. Colletta, "The use of indigenous culture as a medium for development: The Indonesian case", in *Instructional Technology Report No. 12*. Washington, D.C., AED, 1975.]

We make this point not to set off a political debate, but simply to ask that national and international strategies be unambiguous about what they are doing and why. To say that we will use the culture to change the culture is an acceptable way of justifying an indirect, informal strategy of change. It is also an effective one, as we have seen, in that it reduces resistance, uses familiar people and materials as well as agents of change and calls for very small, incremental changes in the daily behaviour of persons and institutions. With this strategy, however, the implementation is far slower, and more subject to reversion than is often admitted. At any rate, it *does imply* manipulating the environment of people who may not be aware of it, nor willing to accept this manipulation if they had the choice.

Finally, the variables are sufficiently limited and controlled to allow for what we have called qualitative, intuitive or personal planning – as opposed to the more rational, impersonal and quantitative planning used for large-scale projects at the ministerial level. At this local level, the 'planners' understand the situation well enough to be confident of their assessment and project design. The plan for implementation is generally not formalized but verbally worked out and agreed on by the principal parties concerned.

In contrast to this, small-scale projects with external origins have a planning cycle that is far more deliberate and precise. The problem here is delicate and complex – how to design a project so that it will be diffused rapidly in an unfamiliar local setting where diffusion is normally slow and innovations only accepted after certain key persons have tried them out and approved. There is here, as suggested earlier, a contradiction between trying to innovate rapidly and achieving effective, durable adoption. The process of identifying local opinion leaders, permeating local media and meeting places, waiting for the idea or instrument to catch on, and so on, is slow and uneven. In a sense, the slowness is positive; it attests to a firm integration of a new behaviour in the performance of people and institutions. A more rapid acceptance and utilization would be more unstable, more superficial. An abnormally slow rate of implementation, however, threatens the innovation with absorption into the local network which itself remains unmodified. Scant external resources or high-level administrative support are needed – or, often, wanted – in a project of this type. They are, however, available when needed, which is an important asset that locally originated projects do not have. Our evidence suggests that these resources and support are used more extensively once the innovation has reached the plateau of moderate acceptance and expansion.

The objectives are realistic, as is needed to ensure implementation by indirect or informal means within the local framework. Since these projects are not 'showcase' innovations, nor are they heavily aided by outside funds, there is less administrative and political pressure for rapid or massive results. This is a privileged and unusual situation among the many projects we have reviewed. For the most part, the strength of the expressed need and perceived degree of urgency preclude a slow moving, small-scale strategy of innovation. The survey data indicate, in fact, a relationship between political intervention and realism of objectives. For example, political leaders are actively involved in projects with very ambitious and probably unattainable objectives far more often (59 per cent) than in projects with low-moderate objectives (12 per cent). And logically they make more frequent speeches concerning the projects with very ambitious or probably unattainable objectives (60 per cent) than with low-moderate objectives (30 per cent). Political pressure, therefore, can force a project towards objectives which cannot realistically be attained. We have seen this illustrated, for example, in the first project type.

Implementation

We will now review briefly the performance of these small-scale projects as they confront some typical barriers, as well as some problems not generally encountered in the three other project types.

Insufficiences in equipment and trained personnel. Typically, these projects have high material needs but few possibilities of meeting them. In fact, the possibilities are so reduced that a number of projects fail at this stage. Others further limit their scope. Still others try to dramatize the urgency of the problem or the benefits likely to accrue from the innovation in order to recruit volunteers, loans of facilities and materials, etc. As indicated earlier, externally initiated projects can tap needed resources more easily, but the originators are careful to regulate this in order to keep the project from being exploited for personal ends. In locally originated projects, this potential generally does not exist, even when the innovator is a well-placed, local official. A typical description of this problem is found in the Woodhouse and Lubis study of an Indonesian rural vocational education project:

> The local origin of the project and the dynamic leadership and support of the Bupati, have lent the programme a special strength. At the same time, however, it is deprived of the strength and resources of programmes that have a national base to provide organizational and administrative support and resource provisions. The programme would have a surer future if its local roots could be nurtured by a national commitment and thrust toward rural development as well as by de centralized development planning. (36)

Resistance is typically greater during the initial period of execution than later on, unless the situation is clearly critical. The innovator, aided by a few others, usually initiates a project alone and in the face of a reserved, slightly sceptical public. As local leaders and opinion leaders get actively involved and speak in favour of the project, resistance is lowered. This pattern approximates the famous S curve of individual adoption (see chapter II):

The technique of mobilizing local opinion leaders was used successfully in the initial phase of the Colombian ACPO project:

> ACPO has developed a network of local parish organizations throughout the country to promote and strengthen its mass media educational programs. Initially, the key figure in the success of such local organizations was the parish priest. "When he [the priest] wishes, there is an organiation; when not, none exists." (37)

Lack of requisite knowledge of skills accounts for much of the initial resistance. Here, local innovators are *obliged* to reduce the amount and intensity of change demanded by spreading these demands over time and breaking them down into small, easily mastered steps. This means long periods of trial in unthreatening conditions, and strong assistance during the initial period of adoption or implementation. Once again, if the project responds to a real need, the motivation for learning or for risk-taking in general will be increased. It is because of this that projects of the third and fourth type are frequently successful.

Leadership is a particularly crucial variable in this type of project. Without stable and at the same time diplomatic leadership (A + can be a handicap in this model) the project either dwindles in energy and impact or encounters heavy resistance. The objective is to achieve C + by demonstating the merits of the project, rather than by using administrative or political authority to gain support.

The procedural problems encountered in the first three project models are absent here. Both the scale (EL) and expectation of behavioural change (BC) are small, and the radius of activity is reduced enough to allow quick and efficient communication, coordination, and decision-making. In a sense I + is built into the setting. On the other hand, there are procedural problems which are unknown, or far less acute, in the other project types. The case-study literature indicates that, since these projects operate to a great extent outside the conventional administrative structure, or are not supported actively from above, it is slower and more difficult to obtain authorizations, exceptions to approved practices, access to provincial officials, etc. To be sure, externally originated innovations of this project type do not have this same handicap, and this can be a precious asset. On the other hand, these projects are subject to greater pressure for immediate, tangible results. In the survey responses, we note that 48 per cent of the projects with low-moderate objectives have problems dealing with 'too many rules and regulations' as compared to 36 per cent of those projects having very ambitious or probably unattainable objectives. Of course, *all* the projects of this sample are externally aided and supported at the ministerial level, but these results show that projects of the fourth type seem to encounter greater administrative barriers than the 'alternative of grandeur' or 'crusade' types.

A final barrier for all types of small-scale or local innovations is the difficulty of generalization. This is not only due to the fact that they are designed for, or grow to fit, specific local situations which by definition cannot be replicated but also that too small a section of the outlying system has been touched so as to prepare it to accommodate to the innovation. For example, a teacher who has designed his or her own primer and communicated it to others (who use it to advantage) finds that the state examination is based on another official primer. Most projects involving the development of new curriculum materials confront this problem, and at least one documented project in our sample – a South Pacific regional curriculum project – was severely limited in its impact as a result. The larger the scale of innovation or, alternatively, the more comprehensive the planning, the greater the likelihood of avoiding or, at least, of partially resolving this dilemma. In other cases, the innovation is limited to a marginal or purely local status until other components around it and administratively or politically above it are unblocked.

Outcomes

Short-term and long-term outcomes have already been discussed in the course of this analysis. Projects which pass the cap of initial resistance and insufficiencies in materials and personnel are likely to succeed in meeting their objectives. They are likely to have durable effects on their target public and, often, on neighbouring villages, populations or institutions. These effects are modest.

In some cases, however, the project may be 'swallowed up' by the environment because the change is *too* slight. This is the case in the curriculum development projects cited earlier, but it is less likely to be the case with an externally originated innovation, often part of a larger plan.

These projects cannot, for reasons given above, be taken in their original form and generalized on a large scale. If this is done, they tend to become projects of the first and second types. They can, however, be diffused gradually by means of the same strategy of social or indirect intervention described here, an effective approach in very different settings. It is likely that a widespread, decentralized strategy of informal persuasion is less costly and, in the long run, more effective than large-scale administrative innovation. Not all projects, however, lend themselves to this form – particularly those requiring centralized training, sophisticated equipment and facilities and uniform production of materials.

Notes and references

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15. Lallez, R. Upper Volta, *op. cit.*
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CHAPTER FOUR

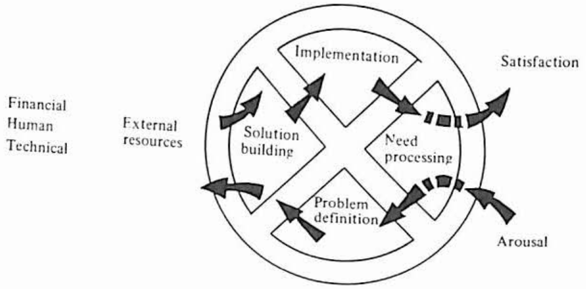
Origins of innovations in developing countries

GENERAL DIMENSIONS

This chapter looks at some general patterns of project genesis: how innovations are initiated, who has the original idea, what motivates the desire for change, and so on.

To do this, it is necessary to refer again to the simple model of the problem-solving cycle presented in chapter II.

FIGURE 27. A rational open problem-solving configuration.



Translated into the language of this model, the basic questions become the following: who senses the need for change and how? How is the need processed? Who defines the problem and by what means? How is the solution designed, and who are its principal architects?

Before examining these questions more closely, it is important to point out that the particular situation in many developing countries helps to determine the form that the problem-solving cycle will take, especially where large-scale, nationally or centrally conceived innovations are concerned. Some characteristics of this situation are set out below.

Structural lag. In the previous chapters, it has been shown how and why the need for change is felt so strongly and urgently in developing countries. Recent independence, political and popular pressures, inappropriateness of the colonial system, necessity of attaining economic self-sufficiency: these are some of the principal causes or 'precipitating conditions' making the need for change so strongly felt and leading it to be so rapidly acted on. There is a general feeling that the existing educational structures are no longer adequate to meet the new demands, and this leads to a public mandate for change. Typically, during these periods, leaders who are otherwise under conservative pressures are expected to innovate. The 'normal' rules are suspended and there are new opportunities for exercising ingenuity. (1)

This is an interesting and unusual pattern. In countries often characterized as 'conservative', 'traditional' or 'fundamentalist' (3)—that is, where change is generally limited to what can easily be adopted within the present organizational and social structures, without requiring basic changes in that structure itself (2)–innovations are found on a scale often unknown in the most highly industrialized and supposedly 'modern' or 'progressive' countries. The phenomenon of 'structural lag' explains much of this paradox. Education systems in all parts of the world are far more open to change than they would normally be in cases where a crisis or strong popular mandate are perceived.

Separation of those who sense and process the need from those affected by the solutions. This is a delicate point. In a certain number of the developing countries, there may be fewer structured mechanisms for registering public opinion or taking it into account during the planning stage. There is also a smaller elite, fewer 'lobbies' or nation-wide syndicates, a relatively smaller range of political parties, a lower level of education or literacy, and the additional problems of long distances between places, geographical isolation, multitude of dialects and ethnic groups, less elaborate communications infrastructure, etc. This does not imply that the political structures in these countries are less democratic, but simply that there is more difficulty in sensing the multiplicity of different needs for change and returning frequently to these sources in the planning phase to be certain that they have been correctly diagnosed. As shown in chapter III, the strength of the third project type–the 'crusade'–lies in its capacity to perform this function far more rapidly and sensitively than others.

In part, this is due to over-centralization, perceived as a 'serious' or 'very/extremely serious' problem by 31 per cent of our survey sample, and observed in 54 per cent of the cases. It is also related to the perceived urgency of the need, which calls for faster action than this process of sensing and diagnosing often allows for. Brumberg's evaluation of the (highly successful) ACPO project in Colombia may be cited as an example of this phenomenon.

> Related to the problem of feedback is the need of the campesinos to communicate their needs, interests, and desires to the agencies concerned with rural development. These include ACPO and the various agencies of the central government. At present the campesinos have little voice in the development of ACPO's programmes, nor has ACPO systematically solicited their views. This is now recognized by ACPO, which plans to involve campesinos more directly in the selection of content and editorial position of *El Campesino*, making the newspaper more a voice of the campesino than the voice of ACPO. (4)

Lack of prior experience. Innovations are often too ambitious or too rapidly implemented because they are new to the environment. The tendency to respond to the urgency of a problem by bypassing the pilot phase also leads to innovations with which the country has little or no prior experience. In addition, the political or ministerial structure may also be new or relatively inexperienced. This is due to recent independence, young leaders, rapid turnover of key personnel in the project, the necessity of finding 'new' solutions that are unmarked by the colonial influence, etc. On the positive side, lack of prior experience allows for bolder, more sweeping innovations which are often needed but typically ruled out by cautious or more conservative leadership.

Widespread use of external assistance at all stages. Two of the principal types of projects described in the last chapter are characterized by the presence of foreign advisers, many of whom appear to be 'in residence' throughout the problem-solving cycle. This is not in itself problematic, but it does influence the type of planning and the model of innovation selected. Many needed innovations simply cannot be implemented without at least an initial injection of external resources.

These characteristics influence all phases of the problem-solving cycle, but they do so in different ways depending on their relative importance and their patterns of interaction. Some of these different patterns have already been analysed, and the more general features of each phase will now be reviewed.

Need processing and problem definition—genesis of large-scale, national projects

This process has been described in chapter II in its structural and functional components and observed operationally in an analysis of the four project types. In general, it can be said that, at the national level, the mechanisms for searching out and analysing weaknesses or difficulties in the education system can be characterized in the following manner.

Centralization. A centralized policy development and planning office is a necessity in any national education ministry in order to co-ordinate and systematize the information, resources and decisions which enter the system and are converted into plans for solving problems in the in-school and nonformal networks. In many of the projects analysed, this function is assumed by a small number of planners and advisers in close contact with ministry officials. The sensing and diagnosis of needs often tends to start out with the following premises:

- the country's educational needs (problems, weaknesses) are fairly clear; they generally involve insufficiencies (of trained personnel, facilities, materials and equipment) and non-adaptive structures (due principally to colonial influences);
- these needs are urgent, i.e. they require immediate, sometimes drastic solutions;
- these solutions must affect a sizeable part of the education system. They must be either centralized (in order to concentrate resources and students in large, multi-purpose centres or institutions) or disseminated in a fairly standardized form to local settings (by mass production of materials, by radio or television broadcasting, by itinerant teams) with the possibility of local adaptation.

However, planners starting out with such premises are liable to reach a number of negative results. These include:

(a) limiting the time and the number of people involved in the searching-and-scanning phase, with an attendant danger of neglecting important problems or misappraising the particular form that these needs take in different local settings;
(b) increasing fatalism and passivity at local levels, where there is little time to consult on felt needs or viable solutions to problems as they are lived at the provincial or local level (often seen as one of the core problems of underdevelopment itself (5);
(c) moving too rapidly from needs assessment to solution building, with the danger that (i) the objectives may not be clearly understood by many people involved in the innovation, (ii) the solution may be impracticable at the local level and (iii) the entire process may be minimally negotiated with those concerned by the innovation—all of which, but particularly the last, makes resistance more likely when the project is implemented.

Put simply, the danger is that a small number of people may decide among themselves, in a short period of time, on the basis of little information, on solutions concerning a sizeable part of the education system. The ready rejoinder is that few people are qualified or can be appointed specifically to do this work given the limitations dictated by the situation. The urgency of this situation, it is argued, calls for bypassing more sensitive or differentiated ways of identifying and defining needs since they will only serve to slow down and complicate the cycle.

The evidence found in this study suggests that these pitfalls are indeed encountered, and that they can compromise successful implementation. As an example, Ahmed's evaluation of the mobile trade training schools in Thailand may be quoted.

> The usual procedure for determining the location is to send one or more MTTS teachers to interview the government officials of the *Changwad* (province) and the *Amphur* (district) regarding the interest of the local people and the need for an MTTS in the locality. Often a location is selected because Changwad officials request it. Non-officials, such as businessmen, local leaders, prospective employers, and so on, are usually not consulted.
>
> So far as ICED researchers could ascertain, the decision on location of a school is not preceded by an economic survey of the district in terms of occupational and employment structure of the area, present and potential employment demands, other skill development opportunities, and the economic development plans and potentials of the area. Such an exercise, even in a relatively crude fashion, would probably have highlighted the divergent circumstances of different areas and the importance of designing courses for the specific needs of the locality rather than offering everywhere a selection of courses from the same limited list. The implicit assumption of the Vocational Promotion Division's programme is that the training needs of its clientele are fairly uniform throughout the country and the standard list serves these needs adequately. (6)

All the negative results stemming from reliance on a set of premises are present here in a mutually reinforcing pattern,. This sometimes leads to the constellation I – A – C – or I – A + C – presented earlier. In this particular case, the project tended to graft itself on to local vocational training practices, on which it apparently left few traces. Many of the literacy projects reviewed in the Unesco assessment (7) were subject to the same syndrome. However, it must be remembered that with such nonformal programmes, data are less easily available, negotiations are more complex and co-ordination is more difficult to achieve than in the more uniform, centrally administered, formal schooling network.

As a second illustration, here are the results, expressed as percentages, of the following question in our survey: Was the need for change clearly defined and understood by different groups?

	% very clearly/clearly	% not very clearly/not at all
Public		
Education leaders and officials	80	20
Teachers	55	45
Trainees (teachers in training)	49	61

At the risk of making an unwarranted inference, it would seem that approximately half the people destined to be the principal executors of an innovation did not clearly understand it. While this may often be the case with trainees in most institutionalized programmes, it is less typical of teachers and teacher-educators who normally would have been involved—directly or through representatives—in the phase of need definition or at least well-informed of the needs to which the project directed itself. A possible explanation here is that the urgency of training or retraining teachers precluded this step in the cycle. Another is that teachers and possibly trainees would not have accepted the way in which the problem was being defined at the ministry or inspectorate levels.

Primary reliance on people rather than on data. Much of our information, in particular the interviews and project evaluation reports, indicates that needs for change are assessed, screened and interpreted by a small group of people who consult each other more frequently than they consult pre-planning data such as surveys, statistics or reports from provincial officials. Some of the obvious reasons for this phenomenon would seem to be: unreliability of the data; lack of time to contract, conduct and read these documents; sentiment that the needs are clear and urgent enough to bypass (costly) confirmation from other sources; absence of a structured, articulate public opinion or of an easily accessible network of people representing local interests, etc. It has already been shown how, in certain project types, political and educational leaders stake their authority and reputation on their own definition of what is needed and the solution they are supporting. Their options for change in education are meant to capture accurately the national aspirations. This is, of course, the way in which political leaders are elected. Their choices generally derive from a personal conviction, which has been tested on a small group of advisers before being publicized. To be sure, people are also sources of data; they register and analyse a good deal of information and can transmit it. The problem is that individuals tend to register only certain kinds of information (consonant with what they already have) and to do so in certain ways (consonant with their particular outlook). When these individuals are few and are grouped at the policy making level, there is a likelihood that a good deal of pertinent information is either not being looked at or is being looked at in such a way that it cannot be accurately tested against other sources of information.

It is important to make two points here. First there are highly rational and rigorous ways of managing inputs, as presented in chapter II. However, these procedures may miss some of the complex inter-relationships and the nuances which are often better captured intuitively in discussions between informed officials and advisers. By the same token, an intuitive and rapid cycle of assessment and interpretation of needs may be defective in rigour and rationality. Still, political leaders would not have been elected nor educational leaders appointed if they were not expert in making rapid judgements on the basis of little and ambiguous information–with a high ratio of correct judgements.

Secondly, although the structures for input management may exist in a relatively elaborated and responsive form in highly industrialized countries, they are not always used in assessing and interpreting needs for change. As mentioned earlier, the more ambitious the project, the more likely the cycle is to take on a predominantly political rather than technical character. For example, a review of the origins and history of the British Open University, as documented by Mackenzie and his collaborators, reveals clearly the pattern just described:

> On 8 September 1963 Mr Wilson, the leader of the Labour Party, then in opposition, announced that his party was working on plans for a 'University of the Air'. The new institution, as he saw it, would provide through television and radio programmes, reinforced by correspondence tuition, tutorial classes and short residential courses, a new way of obtaining formal qualifications of university standard. It would also offer professional and technical refresher courses. In the spring of that year, he had visited Chicago to examine the city's Television College. He has since spoken of successive visits to the Soviet Union in the course of which he was greatly impressed by the organization of its university correspondence courses.
>
> Mr Wilson's party took office in the autumn of 1964 and, early in the next year, he transferred Miss Jennie Lee (now Baroness Lee), to the Department of Education and Science as a Minister of State with special responsibility for the arts and for the development of his new educational project. That summer, she established a small Advisory Committee to explore the possibilities, taking the chair herself and making it clear from the start that a policy decision which she fully endorsed had already been taken. The University thus had its origins in the realm of personal conviction, and not in any systematic survey of the educational needs of the adult population. It found a place in the Labour Party's plan for education without public debate, and its claim on public resources was never publicly weighed against other educational claims to limited resources. (8)

Early reliance on external assistance. The fact has already been discussed that external advisers are often present from the genesis of a project, and that they influence the shape of an innovation by (a) their insistance on careful planning, (b) their tendency to favour generalizable models of innovation, and (c) their access to additional sources of expertise and finance. The impact of foreign assistance is greatest during the next phase, the building of solutions, since external aid enters here much more directly. The phase of need assessment is generally considered to be a 'private' part of the cycle, i.e., it is carried on by senior political and ministry officials with the aid of a central planning unit. However there is much evidence to show that external advisers from both bilateral and multilateral agencies are often actively involved in this phase.

To some extent, this is simply because, whatever the solution devised, it will be likely to require external assistance. Therefore, it seems wise to involve the external representative or adviser from the outset. An additional advantage in discussing needs assessment with a competent adviser is that his experience in other settings brings a relatively fresh outlook on the national situation.

Finally, external advisers can call attention to certain needs by serving as spokesmen for groups which either have no access to national officials or who are unwilling to express publicly their dissatisfaction. As such, the adviser plays a role similar to one often played by expatriates in a local setting: both are people less tied to the local situation, willing to expend an unusual amount of energy during their stay and often compensating for their lack of integration in the community by devoting themselves to their work. Thus, they can vocalize--and even amplify--the dissatisfactions of local teachers or village inhabitants who cannot afford to take such risks. (9)

There are, however, a number of possible dangers with early external assistance. They are listed here and will be developed in the next section.

- The assessment and interpretation of needs by external advisers may orient the project more towards solutions which external agencies will fund but which the host country may not really need, i.e. solutions which are not applicable answers to the problem as it is defined.
- There may be a slight, gradual 'disinvestment' on the part of national officials as external expertise shows itself to be enterprising and efficient in conducting a survey of needs for change or in drafting position papers defining the weakness in the education system.
- This, in turn, may lead to discouragement and latent resentment on the part of nationals, a phenomenon which appears more frequently than expected in the project evaluation reports. An African planning officer made this point clearly in one of the interviews.

> When the minister, on the advice of a foreign adviser, called in an external team of planners, we knew that it meant he did not have confidence in our abilities.

Need processing and problem definition–genesis of small-scale and local projects

This phase has already been described in some detail in chapter III. The principal points are summarized below.

- *The immediacy and pertinence of the needs.* When projects are locally generated, the constraints are such that, in order to reach the phase of execution, the need for change must be convincing to a large number of people who are not normally in agreement. Projects which are externally generated but are to be disseminated within a local institution or population must meet the same criterion in order to be implemented directly.
- *The availability of requisite information.* The proximity of all key persons involved helps to ensure that the needs will be diagnosed and the problems operationally defined without losing sight of any important components.

- *The absence of external assistance at an early stage.* The sole exception to this would be the case of the expatriate or itinerant adviser, who draws attention to or verbalizes needs for change which the local population accepts either passively or even actively, if, in the latter case, the change corresponds to a need they have been unable to communicate to the responsible officials.

Building solutions–plans for implementing large-scale, national projects

There is thus, at the origin, the awareness of needs for change in the education system, followed by either a systematic or a rapid diagnosis of those needs by a central political and planning body. Next begins the quest for solutions to the problem raised in the course of this diagnosis.

The present interest here is less in the type of solution *per se* than in the agent or agents who first proposed the solutions and those–often but not always the same–who convince national authorities of its pertinence and practicability in meeting the needs. These agents are the 'innovators'. In order to identify them and to follow their actions, three preliminary points must be made.

1. The role of innovators in such a socially determined field as education is not to *invent*, but rather to *adapt* solutions to specific situations. None of the innovations reviewed here–rural education programmes, educational TV and radio projects, functional literacy, vocational training, teacher training, multi-purpose centres, curriculum development projects, etc.–is 'original' in the sense of not existing elsewhere either before or at the same time as the innovation being planned. These experiments are, however, new or original in the setting in which they are being introduced. It is in this sense, as well as by their being deliberately rather than incidentally introduced, that they are here defined as innovations.

2. In our sample–as in most of the empirical research on the origins of innovation–the solutions are imported from outside the education system itself. The more uncommon phenomenon is that they are usually imported from *outside the country* as well. This happens for three reasons: (a) the educational leadership is dissatisfied with the present education system, which is seen as inappropriate to the country's needs, being often based on colonial values and practices. This leads to (b) the quest for new, large-scale solutions which, by definition, do not exist within the country. Finally, (c) the option for starting with a pilot project operation within the country is usually rejected because of the perceived urgency of the needs. Consequently, the innovator is likely to be someone with access to educational innovations in other countries, either directly (as a result of visits, internships, further studies) or indirectly (as a result of reading, discussion with outsiders, etc.).

The survey results confirm the extent of outside contributions to the design of innovations in developing countries. In only 11 per cent of the cases is the project described by respondents as 'entirely new and original, not based on outside technical knowledge'. The majority (63 per cent) of cases entail innovations which combine 'ideas from inside and outside' the country.

3. The number of persons responsible for assessing needs at the national level is small, and their status or position in the educational hierarchy is relatively high. This tendency towards centralization of decision making was analysed earlier, and it means that these persons are not easily accessible, except to others of equal status. This acts to further limit the field of potential innovations.

The innovator is therefore the person who typically brings an idea or project from outside the country to those inside it who are responsible for devising solutions to major problems. As discussed earlier, our analysis shows that information coming from persons is often more credible and more exploited than information coming from impersonal sources provided, of course, that the two sources are not in flagrant contradiction. What appears to count the most in devising and acting on solutions is the advice of the persons surrounding the political and educational leadership, and these persons are less likely in the first instance to be technicians (planners with access to the mass of impersonal pre-planning and survey data on the potential needs) than advisers who have spent a relatively long time with a president or a minister and whose advice has therefore been 'tested' for credibility and reliability. As shown earlier, the same situation holds true in highly industrialized countries—despite appearances to the contrary—with a difference only in the relative weight which is given to personal and impersonal sources of information.

Types of innovators. In the light of our evidence, it is possible to distinguish four types of 'innovators' corresponding to the profile drawn above.

(a) *The senior university professor or administrator.* This is perhaps the most likely or logical catalyst in the context described: a senior person with high status, access to and mastery of information on new ideas and practices, and with contacts at the ministry. Most important, he does not constitute a threat within the existing political or ministerial structure because he is an outsider who is not competing for influence or promotion. In addition, he lends professional credibility to demands for outside assistance emanating from the ministry. To cite an interview with a Latin American ministry official:

> The key person was the dean of the school of education. The idea had been mentioned before, but he was the one who got it inside the ministry.

The head of an Asian teacher training college had this to say:

> Many of the ideas are thought up in the university. They [university professors or researchers] ask the government to finance a small pilot project or they write up a request to an international agency for the government to present. They know how to make proposals in the right language with the right arguments.

To give a final example from the case study literature:

> The development of this project must first be considered in the context of a collaborative venture involving principally the Senior Research Fellow of the UWI (University of the West Indies—Mona) School of Education concerned with the teaching of mathematics in schools and the Senior Education Officers in the Ministry of Education responsible for the teaching of mathematics. All were professionally concerned with the introduction of relevant new mathematics material in Jamaican schools. Each, through his overlapping set of responsibilities and the wider circle of professional colleagues, was able to involve the assistance of others. (10)

(b) *The ministry official.* This is typically a planning or policy adviser to the minister who is sent on periodic inspection missions abroad and to international and regional workshops. He collects a good deal of information, establishes personal contacts and identifies sites or projects which try to meet needs similar to those of his own country. He is often the liaison in the ministry for projects initiated in the national university.

Very schematically, we can identify two 'types' of official. The first is middle-aged, trained in national institutions or trained more briefly abroad and is likely to have risen slowly in the hierarchy from a provincial post. The second type is fairly young, trained abroad and holding an advanced degree, which enables him to be appointed directly to an important post. The type of projects which each sponsors, and the arguments used for sponsoring them are different. But, until recently, the first type of official appears to have been more successful in getting solutions adopted. His advantage is now on the decline in several countries where more planners or 'technocrats' of the second type are being appointed. Evidence of this comes out in an interview with a director of several African and Asian projects:

> The political and educational élite is not opposed to innovation. On the contrary, it is the non-élite which is conservative. In particular, some of the young, foreign-trained nationals are a wedge for change; but they are threatening to some of the older, less well trained administrators who resist their proposals. Still, they are moving more and more into positions of power.

The same point is made more pointedly by a Caribbean expert:

> Yes, there is a tendency not to believe the foreign-trained national when he comes back. It is almost as if one had to admit that he had become better than oneself just for having been abroad a few years.

(c) *The political adviser.* This is the 'grey eminence' figure, consulted often by political leaders or ministerial officials on the benefits of different proposals. He usually is not a specialist, but rather an experienced administrator or former political figure with keen judgement on the relative chances for success of large-scale changes in the education and training system. As the key 'gate-keeper' in the government or ministry, this person hears about most of the proposals coming from without which do not go through the usual administrative channels (and many that do). His role is less that of an originator than of a crucial communicator of an innovation idea within a decision-making council.

(d) *The foreign expert.* The role played by the foreign expert is similar to that of the university dean except that the former can afford to take greater risks–due to his limited commitment to and limited dependence on the host country. He is less well known domestically and therefore less likely to have accumulated well-placed political adversaries and has, in some cases, privileged access to ministry officials at all levels. He is not perceived as promoting a particular project for his own self-aggrandizement and, finally, he has direct contact with external sources of finance. His skill often lies in proposing a solution to the national need which (a) appears to be appropriate to the national context, and (b) is unlikely to be politically problematic for the existing government to implement. His skill also lies in being able to survive changes of government. In some cases, the solutions proposed by the foreign expert are eagerly sought after because, as explained in one of the interviews, 'there is sometimes jealousy between ministries in large-scale projects; each ministry wants the budget and the increased visibility that can lead to promotions'. Once again, empirical research in highly industrialized countries reflects a very similar institutional dynamic at work. (11)

Ambitious yet non-controversial solutions

The foregoing identification of the principal catalysts in the solution-building phase leads naturally to an examination of the solutions themselves. One general point which can be made about them is that, while they are frequently large-scale (EL +) and ambitious in their objectives (BC +), they are, for the most part, neither controversial nor revolutionary. The third project type (the 'crusade') may be an exception. As shown in chapter III, resistance here is often encountered at the local level during the implementation phase, but seldom in central political or administrative councils. This point about the type of solution chosen appears in several interviews. To cite, as an example, the remarks of a Caribbean specialist in teacher education:

> The big projects, especially those assisted by international agencies, aren't 'sauvages'; they don't come from individuals. If they do, they pass through a filter in the ministry that puts them more in line with government policies.

Similarly, the survey results show that the problem, 'opposition [to the innovation] by political leaders', is very rarely a serious one (2 per cent of those responding), and that very few respondents (4 per cent) felt that the project 'might have results which would disrupt the existing political situation'.

Some of the reasons for this phenomenon have been mentioned earlier. They are summarized below and followed by a more detailed discussion of the last two points.

- General, shared perception of urgent needs for change;
- limited élite; frequently a one-party government;
- large number of projects depending on external sources and so limiting the necessity of difficult sacrifices from within;
- possibility of personal advancement through the high visibility and increased budget provided by the innovation;
- credibility of a few, well-screened outsiders with access to key decision-making councils;
- sensitivity of bilateral and international agencies to government priorities;
- evidence that the projects, however large-scale and ambitious, are not radical enough to make a significant dent in the area of need;
- centralized process of administration and decision making;
- global nature of the objectives, suggesting that a compromise has been reached on proposals which were initially more controversial.

Centralized administration. As seen in the first two project types described in chapter III, whatever the solution may be, it is normally implemented through regular administrative channels. In this way, control over the short-term outcomes is guaranteed at least minimally. Funds, decisions, personnel and facilities are not, as a rule, entrusted to agents not holding official leadership and administrative functions.

In some cases, this can, paradoxically, be a stimulus to innovation for those who know how to function in this labyrinth. When objectives are global and plans for implementation are precise, it is possible to give a particular direction to a major project—or even initiate a smaller one—and have it very rapidly executed. There is a good deal of inertia in this type of structure (centralized, typically hierarchical and containing large numbers of people and functions). While it is very difficult to get any new initiative moving, it is also very difficult to stop one which is *already* moving. It appears to be the more experienced, socially sophisticated, external adviser who specializes in this type of change. To quote one of them:

> You have to know how to move in the interstices. There is a lot of room there to do new things. If there is no regulation against something, you just do it and explain later. If there is, you ask for an 'exception' and, while you are waiting for it, you start in as fast as you can, so that it will be harder not to grant it to you.

In other cases, this centralized structure is perceived as a barrier to change, especially by certain external teams of experts who often ask for a parallel or separate administrative channel for their project. This request is seldom granted and, when it is, project personnel often complain of being isolated from government officials and of lacking administrative aid in implementation. The following pattern is not atypical:

> Although the government resisted the idea of a discrete, experimental project, limited to three geographical areas, it finally agreed to the plan, only to continue to resist its implementation in

> a number of direct and indirect ways until the project was prematurely terminated. The government subsequently reverted to its original idea of the incorporation of functional literacy activities within its rural education programme on a national scale. (12)

As we have frequently observed, the extent of change produced by the types of innovation being studied here will be directly associated with the amount of administrative support for it (13). Administrative *support* is usually contingent on administrative *control*. This point is made frequently in the interviews by national experts and officials. To quote an Arab States administrator:

> To succeed in projects involving many people and institutions, we must have good relations with the government at the highest level. To do this, we must work within government structures, not create new structures outside them.

Global objectives and compromises. The solutions proposed lose much of whatever radical quality they may have had, and the project objectives are defined in very general terms. As shown earlier, 'lack of common understanding of project objectives' is one of the most frequently mentioned 'serious or very/extremely serious' problems in the questionnaire (40 per cent of respondents) and project evaluation reports (46 per cent). The questionnaire results show that in only one-third of the cases were objectives 'very precisely' defined, despite the fact that technical assistance projects are commonly more rigorous in this respect than others. To some extent, this practice is deliberate. Innovations are presented in such general terms as to make them acceptable, even appealing, to all parties (14). In this way, conflicts are avoided at the outset, agreements are easier to reach and implementation is more rapid. The difficulties arise later: conflicts and resistance, confusion, the impossibility of conducting a rigorous evaluation, etc.

This practice also reflects a compromise which itself limits the radical nature of the solution proposed. As no clear option has been taken at the policy level on a controversial problem, when this results in confusion during the implementation phase, the typical decision is to remain close to the *status quo* until precise directives are given to the contrary. Such directives, of course, depend upon a clear option being taken —and this possibility was ruled out in the beginning. To give an illustration often found in the research on educational change: agreement is often reached on nonformal education programmes as long as they do not call into question teaching and examination practices in the formal education system. The option is to create something *outside* the system, and not to re-structure the system itself. Both in-school and out-of-school officials will often applaud such an innovation. For the in-school official, it means that greater relative importance is being given to the education sector and an alternative route being provided for those who cannot accede to or succeed in formal schooling. For the out-of-school official, the innovation increases the size and significance of his network. But conflict would arise immediately if their discussions had centred, for example, on awarding formal school certification without a separate examination for those in the new nonformal programme, or on revamping the curriculum of the formal school network in order to align it more closely with the nonformal study plan. These are precisely the decisions which are *not taken* in most cases and which almost invariably result in unforeseen confusion and conflicts within and sometimes between the two systems at a later date. The history of the compensatory education movement in North America and Western Europe is similar.

A concrete example of this phenomenon can be seen in Lallez's account of the CER Rural Education Project in Upper Volta (15). It was never decided whether the rural centres constituted a replacement of or an alternative to the official primary school. In order to recruit teachers and pupils and to put more emphasis on vocational training at the primary level, the argument of replacement was invoked. In order to allay the fears of villagers (where primary schools existed) and of school officials, it was suggested that this could be an alternative route for elder, younger or less successful pupils. According to Lallez, this ambiguity compromised the implementation of the project, but it seems to us that such compromises helped to facilitate approval for the more modest, yet large-scale initiative. To cite Lallez:

> Sometimes it is seen as a useful but temporary stop-gap for a reform of basic education which needs time but is planned for the not-too-distant future, which leaves the way open, for example, for the decision to close the CER whenever a primary school is set up in the vicinity; at other times it is seen as the strategic means for a new kind of massive enrolment of which it is the embryonic form. From the outset this continual uncertainty and hesitancy were to weigh heavily on the development and ultimate fate of the operation. The absence of public criticism of the classical school, together with the absence of a campaign of opinion in favour of the CER, strengthen the idea that in any case this cannot be a real school so its education must be second rate. (16)

Use of external resources in building solutions. Many of the solutions for national problems need support from outside the country, at least in the initial phase. In this way, the country need not take its scarce human and material resources from other important programmes and invest them all in this project. Also, many solutions call for materials or expertise which do not exist inside the country.

There are, however, two different moments when outside help can be incorporated in a project, and the choice of timing can be crucial in determining the type of solution adopted. For example, officials can decide (a) to diagnose the problem, devise one or several appropriate solutions and then seek resources outside the country for the ideal solution, with the option of limiting the scope of the project if fewer funds, facilities, fellowships or experts are provided; or they can decide (b) to diagnose the problem together with external advisers, with whom they negotiate the type and amount of external aid available for the various solutions.

The difference here is one of emphasis. The second procedure tends to increase the dependence of the two systems (national and international, or national and bilateral) on one another. While these systems may have overlapping objectives, they do not have the *same* objectives, which means that some of the interests of the bilateral or international agency may not be furthered by certain types of projects proposed by national officials. The reverse could also be true. To be sure, by involving external sources of aid in national problem solving at an early stage, one increases the chances of their participation in the eventual solution, but one also increases the chances of having to negotiate that solution on more levels than simply that of the *amount* of assistance. The danger of early involvement is that of arriving at a solution which can be funded externally but which may not be judged appropriate or successfully implemented internally.

Before looking more closely at six of the typical problems which can arise when external advisers are involved from the outset with an innovation, it will be useful to look at two important *benefits* of such early involvement.

Support of latent but unexpressed solutions. The external adviser often corresponds to the textbook version of an 'outside change agent'. He is introduced at the senior managerial level; he commands respect and has the reputation of being competent. He has privileged access to executives and is privy to information which does not circulate as easily among competing officers inside the institution. This allows him to do three things which others cannot do.

(a) He can present proposals on behalf of people who cannot get access to these officials. As one African teacher educator remarked in an interview:

> We can get innovations through which otherwise would not have been approved had Unesco experts not spoken in favour of them.

And another:

> A proposal made by an external expert has much more credibility and prestige than the same proposal made by one of us.

An experienced technical adviser in Asian technical training projects gives a further example of this phenomenon:

> The minister said to me that he'd had the same idea from his planning officers but that he hadn't thought too much of it. But now that *I* was proposing the same scheme, he felt it was worth trying.

The forms and dynamic of this classic pattern have been well studied in the research literature. The pattern is especially pertinent in this context because of the primary reliance on persons rather than on impersonal data when making choices, and it underlines the strategic role of the four 'types' of innovators mentioned above.

(b) The outside expert can also say publicly what others think privately. As a temporary and less-implicated member of the educational community, the external adviser can voice needs which are felt but not verbalized. Meeting these needs would commonly involve unpopular or controversial solutions, which explains why they are suppressed. However, such needs are often important ones, and the external expert can thereby encourage the ministry to initiate a reform which otherwise would probably have been postponed until the situation became critical.

(c) The outside expert can also help to find other external resources which will permit solutions that would otherwise have been rejected. This is notably the case with controversial, unpopular or very original proposals that would otherwise be rejected out of hand for lack of means of carrying them out.

To illustrate some of the typical interactions between these three functions, here is an excerpt from an interview with a technical adviser in Central Africa.

> The idea came from a secondary school English teacher, who had used micro-teaching on a very limited scale in his classes at the secondary-level teacher training institute. He proposed that it be used at the institute and elsewhere. There was a lot of resistance from almost everyone, but he held out and kept fighting. He got support from a Unesco expert. The expert went to the ministry, got approval for a wider application and was able to organize seminars and bring in some video equipment.

Insistance on more careful planning. External advisers are usually aware of the advantages of a systematic but responsive planning cycle, so that the most important needs will be sensed correctly and turned into realistic solutions. These advisers serve, therefore, as unofficial monitors of the problem-solving cycle in the ministry, and can help to make plans less approximate or less hurried. In particular, they can urge officials to spend some time anticipating the types of problems likely to occur in the project so that they can be taken into account in the plan of operations.

Problems in early external involvement

A number of these problems have already been evoked in our description on the first three project types, and they will be treated again, more systematically, in chapter VI. Therefore, they are simply listed here, with an indication of the way in which advisers' involvement can influence the type of innovation adopted.

By 'early involvement', we mean that outside experts are present, and sometimes dominant, before a final solution is devised: that is to say, at the need-processing and problem-definition stages. In this regard, survey responses yield the following information:

- only 11 per cent of the projects are not 'based on outside technical knowledge';
- 50 per cent of the external technical advisers perceive themselves or other external advisers as being involved as 'originator' of the project;
- these advisers see outside help as present in the definition of project objectives in 85 per cent of the cases, and dominant ('mostly' or 'all outside help') in 40 per cent.

Similarly, in the interviews, there is frequent mention of a project being 'promoted' by outside advisers, who can facilitate requests for further external assistance in order to launch or enlarge the project. There are even some indications of competition between external advisers or agencies.

Here are three illustrations showing a dominant role played by external advisers, taken from the case study literature.

> The preparatory project for the creation of a post-primary education programme in Rwanda was drafted by the Unesco expert who has been in charge since January 1969. This task was entrusted to him by the National Minister of Education at that time ...
>
> In Senegal, in April-May 1968, Unesco experts drafted a project for agricultural classes with three objectives ...
>
> Rwanda's draft project has been inspired by these two experiences and by preceding events, keeping in mind the social and economic situation of the country. (17)

> The project was initiated by Unesco as a micro-experiment. Unesco defined the general outline while the detailed definition of the objectives was elaborated by the Training Section of all enterprises concerned. (18)

> The use of ITV in the Ivory Coast was stimulated apparently by Unesco and French experts who visited the country in 1967. The idea was accepted by President Houphoët-Boigny. Planning for Ivory Coast ITV began in France in 1967 (and has resulted in nine volumes of planning documents). Ivory Coast officials signed an accord with France and Unesco in 1968. A centre for teacher training was established at the provincial town of Bouaké in 1968, with the intention of training teachers to be principals and directors in the new schools. In 1970 and 1971 the television centre was built at Bouaké in order to be near the training activities. Advisers and technicians were supplied by France, Unesco, and Canada. And actual broadcast of programmes began in the autumn of 1971. (19)

The first danger of early external involvement is that of *overlapping but not identical objectives.* The bilateral or international agencies are particularly interested in *identifying* and *experimenting* with models of foreign-assisted projects which can be applied in various countries without requiring massive local adaptation. Agencies which succeed in elaborating such models find their contributions more rapidly implemented, more often solicited and more prestigious. This, in turn, enables them to extend their programmes, personnel and budget. The same concern for finding generalizable solutions operates also at the national level, where officials are eager to find solutions which can, in the short term, be applied on a large scale and in different settings. Below is an example of a conflict of objectives, cited from the Unesco evaluation of its Experimental Literacy Programme.

> The early phases of the Algeria project suffered because of a lack of agreement between the national authorities and the international experts concerning the basic nature of the project. The international experts wished to conduct an experiment in limited geographical areas while the government was committed to a programme of mass education designed to prepare citizens for full participation in its new socio-economic programme. (20)

Inappropriate or impractical solutions. The danger of a model is that it seldom applies to any one specific situation. And one of the characteristics of innovation in a field such as education is that the number of discrete and interacting variables is so great that no one situation resembles another very closely, even in two neighbouring villages (21). Given the number of people and facilities involved, of course, it is necessary to ignore the differences between children, between adults and between schools in order to manage them rationally, or even to be able to manage them at all.

Large amounts of external finance are often associated with unrealistic objectives, but the specific problem here is the gap between the model being promoted by external experts and the national or local setting. Generally speaking, the degree of similarity (isomorphism) between the model and the setting will be a predictor of successful implementation. However, early intervention does not help to ensure such similarity since the host country may become the experimental terrain for a project. The local setting becomes thus not the subject but rather the object of the innovation. This appears to have been one of the principal dilemmas in the Unesco Experimental World Literacy Programme (the programme title already signals the problem). The very concept of 'functional' literacy implied local adaptation, but the principal objective was to devise 'experimentally' a generalizable model of intervention (22). The ambitious, carefully built 'Plan Christol' in Upper Volta for the reform of primary education (23) is another example of foreign advisers devising a highly rational solution which proved inapplicable in the national and local settings to which it referred. Finally, to cite a more general phenomenon, again using the example of Upper Volta, Lallez observes the inappropriateness of solutions conceived by advisers whose cultural values are different from those of the local setting.

> And in this respect the difficulty is extreme. To take by way of example the training of the new advisers in rural education: the method chosen involves the transfer to the trainees themselves of a large share of initiative and responsibility in their own training. The need is to plan and to build up together with the Education Office trainers the programme of their own training. The profound misgivings which this 'non-directive approach' caused them were no doubt due to its divergence from the system of power and decision making in the traditional society of Upper Volta. Compare, for example, the hierarchic and largely gerontocratic system used by the Mossi! (24)

Deviation from initial objectives. These are often cases where the solutions envisaged by national officials are incompatible with the type of projects which external agencies are prepared to support. Below are three illustrations of which the last two come from evaluation reports of an Arab States and Asian project respectively.

> The Madagascar officials did not, it appears, really want a group of full-time experts to take the lead in developing a programme and in working with local groups at all levels. It may be asked whether another formula for helping Malagasy officials to do the job they had in mind might not have been possible. Such a formula could perhaps have better met both the needs of indigenous personnel and specific Malagasy management techniques. At the same time, it could conceivably have provided other countries with useful pointers. (25)

> The initial broad, as well as specific, objectives of the project were confused by the interference of the international funding body in stating conditions for funding which were somewhat outside the intention of the project designers, but which they took into account to ensure adequate funds: [Initially] the national staff of the Education Research Centre were told that the only way of getting funds is to put emphasis on educational planning ... [Such studies had been omitted] because there were already a number of bodies in Iraq concerned in educational planning ... This recommendation changed to a very large extent the design and character of the project.

> The government has its own literacy programme, and the two [national and international] were expected to merge, which caused some compromise in method and strategy.

Risk of subsequent disinterest. Much empirical research and a little common sense tell us that when others invent solutions for our problems a number of things are likely to happen. First, we find out that our problem is not exactly the one to which the solution addresses itself. Next, we do not take full responsibility for solving our own problems; and, finally, the other person is tempted to involve himself in solving the problem for us, which in turn, contributes to the first and second outcomes. In short, when others invent solutions, we are less *committed* to the implementation phase. Our first illustration of this comes from the summary of the Rand Corporation study of recent educational innovations in the United States.

> We observed another mode of project initiation which could also be characterized as 'problem-solving' in some sense–but the important difference was that the 'problems' and resulting 'solutions' were not identified by local educational personnel. And, as a result, school personnel did not evidence similar commitment and support for these projects. That is, change agent projects were begun in a few instances because people or groups outside of the school district's normal political system felt strongly about a particular project or need, and developed the project on their own with the hope that the district would take it over. But in the projects we visited, these hopes were not realized; the district merely played indifferent host. For example, in Bikson, a local university developed a model career education project and then 'sold' it to the LEA. The faculty even assisted the LEA in writing the proposal–but they played no role in the actual implementation. The LEA never became seriously involved in implementing the project, however, and the project never got off the ground. (26)

Indirect evidence of this problem is seen in the following questionnaire results:

- the frequency of *internal* financing problems when projects benefited from large amounts of foreign aid;
- the relative *absence* of these problems (in 89 per cent of the cases) when the project was described as 'all new innovatory', that is not adapted from *elsewhere;*
- the large percentage of respondents (87 per cent) observing *both* serious problems of inadequate internal financing and serious problems of (a) lack of interest by political leaders, and (b) lack of good communication with political leaders;
- the perception, on the part of as many as 39 per cent of external advisers, that there were 'serious or very/extremely serious' problems of insufficient 'energy and enthusiasm' devoted to the project by 'persons in key roles'.

Similarly, in interviews and project evaluation reports, the problem is frequently raised of apparent initial interest on the part of national officials followed by non-participation or indifference during implementation. This happens unusually often in regard to regional projects promoted by external agencies (regional centres, co-ordinating offices and the like). To cite from one report of an Asian project:

> This project is believed to be very successful, but right now some big issues appear to be boiling under the surface. The main question now is whether or not the materials produced are relevant to all of the eight participating nations or only to [one].
>
> In the progression of the project it was gradually recognized that the university which was to be the project's institutional base had no great influence on the curriculum development efforts of the eight participating nations. Project experts struggled to extricate themselves from obligations at the university so they could work more with individual ministries, but for political and logistical reasons, that was difficult.

This problem can be particularly acute in view of the importance of strong and consistent high-level support, for the successful implementation of a project.

Neglect or discrediting of internal resources. Early outside intervention, with the promise of additional aid, encourages national officials to concentrate on solutions which depend on resources lying outside the country before internal resources have been exhausted. As seen at the beginning of this chapter, national officials or experts can be resentful of high-level decisions to call in outside assistance when internal expertise is available. It can amount to discrediting internal advice until an external adviser comes up with the same proposal. In some cases, sufficient expertise, funding or equipment cannot be found internally, although this may be true for fewer cases than the external sources of assistance may care to admit. It may also be true, as stated on several occasions during the interviews, that the level of training and expertise of national advisers are beginning to match, and even excel, that of the technical advisers hired by bilateral and international agencies.

This problem of neglecting internal resources shows up in the survey results in at least two places: there is a clear tendency (100 per cent of those responding), when the originators are exclusively *inside* the country, to use extensively those informal networks of persuasion which are so effective in implementing innovations; and there is a negative relationship (r = -.22) between external support and a vigorous search for knowledge and technical resources within the country.

In discussing the influence of external assistance on the *origins* of innovations—as distinct from the influence of external assistance on the *implementation* of innovations (see chapters V and VI) or on the *outcomes* of innovations (see chapter X)—it is necessary again to underline the general problem of dependence which can arise. A strong reliance on external assistance in *devising* solutions can inhibit the confidence of those on the inside in their ability to devise their own solutions. This, in turn, weakens their confidence in their capacity to implement those solutions and increases the tendency to call on outside aid when it is not absolutely necessary, or, alternatively to seek more outside aid than is really needed. One of the clearest indicators of this problem seen in the questionnaire results is the far lower rate of replacement of external finance and personnel when the origins of the project are partially or wholly external, than when the innovation has an internal origin. Much of the strength of the third and fourth project types described in chapter III appears to lie in their internal origins.

Conflicts. There is a tendency, when significant external assistance enters at an early phase, for these experts to make a subtle appropriation of, or identification with, the project. When experts report that 'key persons associated with the project are not open to change' (considered a serious problem in 36 per cent of the survey cases), or that key persons lack 'energy and enthusiasm' (considered as a serious problem in 39 per cent of the survey cases), there is likely to be some degree of 'us-and-them' thinking. Thus, the 'adviser' may come to see himself as the 'innovator' facing up to internal resistance. This point is made directly in the interviews and indirectly in the survey responses. In the latter, we note, for instance, that the problems of social harmony in a given project are more often serious *among* project team members (which include inside and outside experts) (22 per cent) than *between* key members and others (16 per cent). Similarly, project evaluation reports frequently mention internal tensions (64 per cent of the cases) over the decisions to be made in a project. This would indicate that the external adviser can often see himself less as an aide than as a project leader or co-leader.

Building solutions: local or small-scale innovations

This point is treated in some detail in the description of the fourth project type in chapter III. In point of fact, we know relatively little about locally initiated innovations unless they are picked up at the provincial or national level. As reported in one of the interviews, there are enormous amounts of 'home-grown' innovations, but they are not known outside of a very limited radius. Local innovators do not have the funds, techniques or access to means of communication with which to broadcast the innovation to a wider public.

From what we do know, it appears that the cycle is similar to that at the national level. The innovators themselves are very often partially 'outsiders' to the local community, albeit far less so than are expatriate advisers. The solutions tend to be less far-reaching, except in crisis situations, and to be more widely negotiated than at the national level. Outside resources are sought but few are available, and this very often so weakens the project in the initial phases that, if motivations are not strong enough, it may be abandoned.

Notes and references

1. Putney, S.; Putney, G. 'Radical innovation and prestige', in: *American sociological review*, 27: 548-551, 8/1962, cited in Corwin, R. *Reform and organizational survival*, New York, Wiley Interscience, 1973, p. 357.

2. Cf. Parsons, T. 'Evolutionary universals in society', in: *American sociological review*, 29: 339-357, 6/1964.

3. Such epithets are reinforced by Wandira's comment: 'How can innovations constitute departures from existing practices since, to be successful, they require the blessings of existing authorities?' (Wandira, A. 'Changing the education profession', in: Ponsioen, P. ed., *Educational innovations in Africa*. The Hague, Institute of Social Studies, 1972, p. 38.)

4. Brumberg, S. 'Colombia: a multimedia rural education programme', in: Coombs, P.; Ahmed, M. *Education for rural development*. New York, Praeger, 1975.

5. Sensitivity to this problem in planning and execution is noteworthy in the Colombian APCO project (cf. Brumberg, S. 'Colombia: a multimedia rural education programme', in: Coombs and Ahmed, *op. cit.*, p. 4.

6. Ahmed, M. 'Thailand: mobile trade training schools', in: Coombs and Ahmed, *op. cit.*, p. 626.

7. Unesco. *The Experimental World Literacy Programme: a critical assessment*. Paris, Unesco, 1975.

8. Mackenzie, N. et al. *Open learning: systems and problems in post secondary education*. Paris, Unesco, 1975, p. 326. The text merits quoting in more detail, as it confirms some of the other points made in this study:

   '19. Miss Lee came of a mining family, had found her way to a Scottish university and was familiar with the pursuit of knowledge under difficulties both through her own personal experience and through that of her late husband, Aneurin Bevan, a miner's son and a leading left-wing politician of his generation. It was her determination that everyone, no matter what his formal schooling might have been, should in mature life have access to the highest levels of educational opportunity, and her pertinacity which ensured the survival of Mr. Wilson's scheme. It was her insistence that nothing less than the creation of a new university primarily concerned with degree courses would meet the needs of the students whom she had in mind which determined the form which that scheme took.'

   '20. The deliberations of the Advisory Committee resulted in an official White Paper which met with a hostile, or at best tepid, reception. The decision of the government to go ahead was in no sense a response to pressures from outside, or to public demand; it was a political act of faith, calling for determination. The scheme was to consonant with the basic philosophy of the party as the champion of the educationally underprivileged, and with its emphasis at the time on its role in making the fullest use of the latest technologies for the modernization of the United Kingdom.'

9. This role has been perceptively analysed by Evans in his study of Ugandan teachers. See: Evans, D. *Teachers as agents of national development: a case study of Uganda*, New York, Praeger, 1971, esp. p. 148-149, 170.

10. Centre for Educational Development Overseas and the Commonwealth Secretariat. *New media in education in the Commonwealth*. London, Commonwealth Secretariat, 1974. p. 277.

11. This last point is well documented in the Rand Corporation study of recent American innovations in education. See: Greenwood, P. et al. *Federal programs supporting educational change*. Vol. III: *The process of change*. Washington, D.C., Department of Health, Education and Welfare, 1975.

12. Unesco, *op. cit*., p. 97.

13. Cf. Corwin, R. *Reform and organizational survival*. New York, Wiley Interscience, 1973, p. 250.

14. Avoiding resistance through vagueness or compromise is a classic procedure. The underlying institutional or interpersonal structure is clearly set out by Lippitt, R. et al. in: *The dynamics of planned change*, New York, Harcourt Brace and World, 1958, *v*. p. 80ff:

    Let us consider now how the multiple determination of behaviour which is likely to occur in any system of interdependent parts can contribute to the promotion or obstruction of change. The occurrence of resistance to change is easy to understand. If a change is proposed which would meet some of the needs satisfied by the existing arrangements and ignore others, then the subparts whose needs are ignored would oppose the change and insist on preservation of the *status quo*. On the other hand, forces towards change would be generated if the proposed change seemed likely to give satisfaction to subparts not previously satisfied, or if it led to new coalitions within the system.

15. Lallez, R. *Innovation in Upper Volta. rural education and primary schooling*. Paris, Unesco, 1976. (Experiments and innovations in education, no. 21)

16. *Ibid*.

17. Geronimi, C. 'Efforts to establish centres for rural and trade education in Rwanda', in: Ponsioen, P. ed., *op. cit*., p. 145-146.

18. Berka, M. 'Professional education of workers in correspondence teaching in Algeria', in: Ponsioen, P. ed., *op. cit*., p. 200.

19. Schramm, W. *Big media, little media*. Washington, Academy for Educational Development, 1973.

20. Unesco, *op. cit*., p. 22.

21. For a succinct and well-structured discussion of this point, see Sells, S. *Approaches to the taxonomy of social situations*. Washington, D.C., O.N.R., 1963. (Report no. 4)

22. Unesco, *op. cit*.

23. See IEDES and Grabe, S. 'Upper Volta: a rural alternative to primary schools', in: Coombs and Ahmed, *op. cit*., p. 338.

24. Lallez, R. *op. cit*.

25. Unesco, *op. cit*., p. 98.

26. Greenwood, P. et al. *The process of change*. *op. cit*., p. 20-21.

CHAPTER FIVE

Planned and unplanned outcomes

The essential difference between innovation and change lies in the fact that innovation is planned, the idea being that through planning, one can increase the chances of bringing about the desired change. Naturally, the more ambitious the changes being sought, the more things are likely to go wrong and, as a result, the need is greater for careful planning. The only alternative to careful planning with ambitious changes is to have *total control* over the situation. But here again, the more ambitious the change, the less likelihood there is of controlling all aspects of this situation.

The ideal combination of careful planning and high control – which would be the configuration I + A + in our model – is rarely achieved in our sample of projects from developing countries, even in those involving small-scale innovations. However, this combination is equally rare in highly industrialized countries. To cite two recent examples, here is, first, the conclusion of the Rand study on small-scale and moderately large-scale innovations in the USA:

> None of the (29) projects in our sample evidenced a research and development approach (comprehensively planned and experimentally introduced) to change. Local schoolmen did not follow an experimental or even quasi-experimental research and development approach to planned change. (1)

A second example comes from Mackenzie's study of large-scale, 'open-learning' systems in several highly industrialized countries (Australia, USA, France, Great Britain):

> All these ventures have therefore had to develop, implicitly or explicitly, strategies for planning, implementing and monitoring the progress of their work. Though the rapid expansion of post-secondary education in the last twenty years has given both planners and academics much opportunity to deal with the multitude of problems involved in the creation of new institutions, both the novelty of Open Learning systems and the haste with which most of them have been developed have led to a good deal of insufficiently considered improvisation, to frustration, waste of resources and to lost opportunities to set these ventures on a firm foundation. There is much evidence that the staffs and consultants employed have been insufficiently prepared, inadequately qualified by experience or familiarity with research findings, or too pressed for time with limited resources, to produce long-term plans. This has produced, in some instances, redundant activity which could have been avoided if more study of relevant experience had been undertaken. (2)

These illustrations bring out a number of points which we shall be developing in this chapter:

- that careful planning is undertaken far less often than normally believed;
- that the *lack* of careful planning can be wasteful, stressful and ultimately responsible for the failure of an innovation;
- that there may be other ways of predicting or controlling the outcomes of an innovation than by careful planning, (as for example by high consensus, C +, on the objectives);
- that the best laid plans of educational officials are ineffective when the political, social or institutional situation is unpredictable or uncontrollable.

PLANNING MECHANISMS IN OUR SAMPLE

When we say that planning increases predictability and control and, thereby, facilitates implementation, we mean that it helps to:

- make the implementation more rapid (with fewer errors and less time lost on coping with unexpected outcomes)
- make the most rational use of (scarce) resources
- assure that the way the project is implemented corresponds to the initial vision or design
- inform people about what to expect or what to do at each stage of the project implementation
- assess the progress of the project in relation to its objectives at each step of its implementation, etc.

In order to do this, however, planners and officials need to count on the presence of a structure which *enables* them to carry out these activities. In preceding chapters we have labelled this structure or parts of it 'infrastructure', 'procedural configuration' and 'problem-solving mechanism'. Basically, a well-developed infrastructure contributes to a smooth, reliable procedural configuration, which in turn increases the effectiveness of the problem-solving mechanism in solving the educational problems of the country. The two 'structural prerequisities' for a successful problem-solving cycle are, at the least, 'dynamic connexion' (differentiated roles, division of labour, collective goal setting) and, optimally, 'dynamic cohesion' (the institutionalization and routinization of the cycle with strong inter-relationships between members and subgroups of the system). These concepts are defined and illustrated in chapter II.

One of the characteristics of 'developing countries' is that formal, impersonal, or institutionalized problem-solving mechanisms at the national levels are less elaborated (complex, differentiated) than in highly industrialized countries. As a result, there is a relatively greater reliance on informal, personal and non-institutionalized mechanisms, in the sense of there being few specialized offices, services or programmes Of course, similar informal mechanisms are also present in the more industrialized countries, and there is even evidence to show that they can be just as effective as, or still more so than, highly rational and systematic procedures. This would be an important hypothesis to investigate further, in relation to managing innovation in both developing and highly industrialized areas. Some reverse technical assistance may well be called for here. (3)

Again, highly elaborated mechanisms for problem-solving do not necessarily protect against the political or institutional factors that determine if and how an innovation will actually be implemented. It is even possible that the more elaborated the formal planning mechanism, the less sensitive or tolerant one becomes towards these factors – they can be either ignored or treated *as if* they were rational and controllable. This in turn, can act to reduce the predictability of the plan itself when it is implemented.

These planning mechanisms are currently being elaborated in most of the countries we studied. This is perhaps another way of saying that institutionalized change on a major scale and involving national resources is a relatively new enterprise in the educational system of these countries. The following list and Figure 28 display the present state and mode of operation of the planning mechanisms in our sample countries. This is a list of components typically found in a comprehensive plan for implementing an innovation.

- definition of need
- specification of objectives
- analysis of expected outcomes

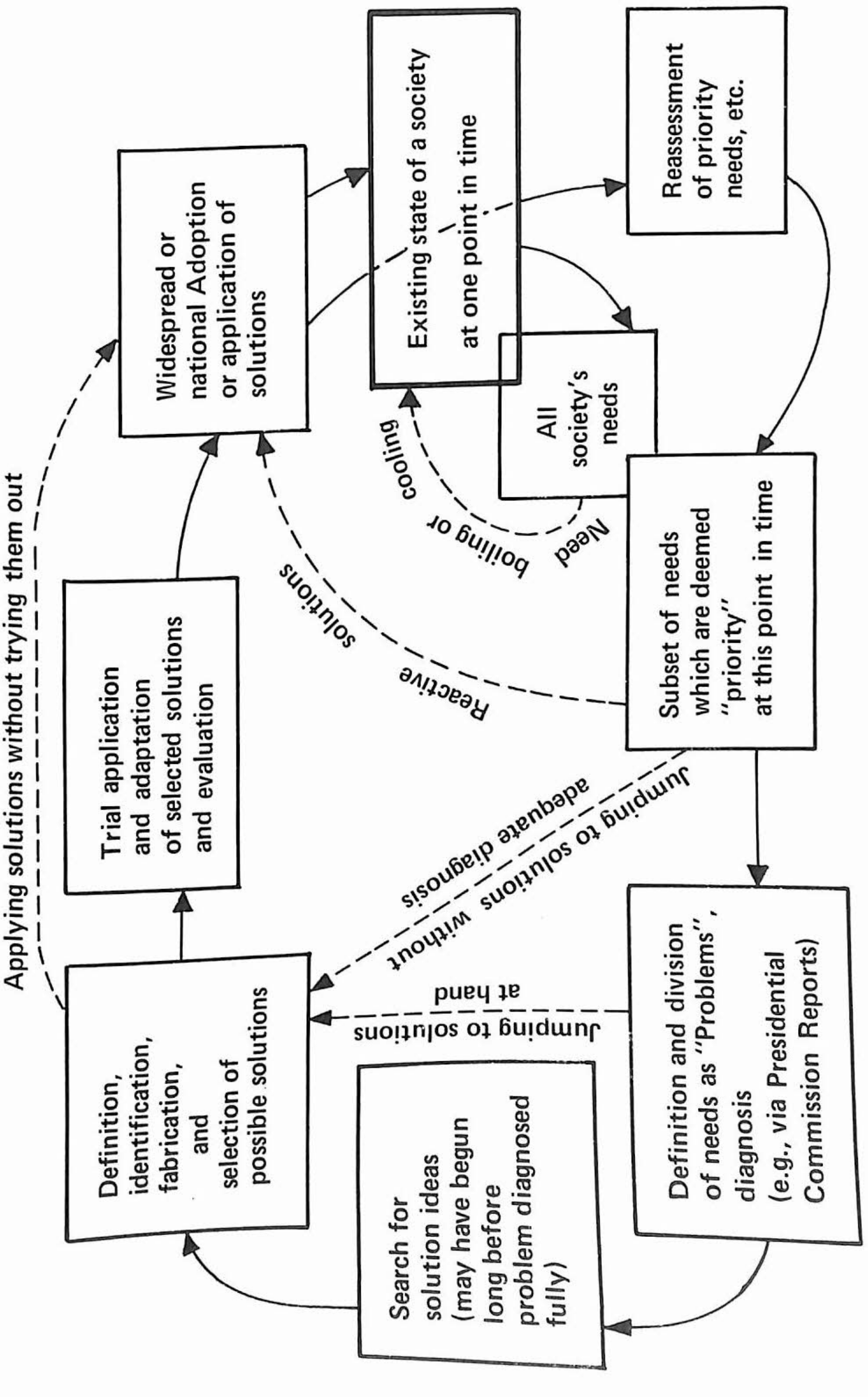

Existing state of a society at one point in time
Reassessment of priority needs, etc.
All society's needs
Subset of needs which are deemed "priority" at this point in time
Definition and division of needs as "Problems", diagnosis (e.g., via Presidential Commission Reports)
Search for solution ideas (may have begun long before problem diagnosed fully)
Definition, identification, fabrication, and selection of possible solutions
Trial application and adaptation of selected solutions and evaluation
Widespread or national Adoption or application of solutions
Applying solutions without trying them out
Need boiling or cooling
Reactive solutions
Jumping to solutions without adequate diagnosis
Jumping to solutions at hand

FIGURE 28. Alternative paths in a social system, problem-solving cycle (4)

- analysis of expected benefits
- analysis of expected financial costs
- analysis of expected costs in non-financial terms
- estimate of manpower requirements
- estimate of material requirements
- specification of organizational structure of the project
- a chart of organizational structure of the project
- specification of steps involved in the project and connexion between steps
- time, cost and manpower requirements for each step
- specification of evaluation procedures
- specification of diffusion-dissemination procedure of strategy

The second chart warrants close study. It depicts the cycle of operations necessary for rational problem-solving. The solid lines represent the comprehensive or full cycle; the broken lines indicate a 'short-cut' taken during the cycle.

Theoretically, we can situate all the innovations studied here on both charts, and thereby describe the planning process more accurately. We can also study some of the relationships between (a) the *number* of component elements included in a plan for implementation, (b) the cycle of operations which the project follows, and (c) the project outcomes. As a working hypothesis, we would postulate that the greater the amount of planning data provided, the more likely it is that the cycle of operations will not include many or any short-cuts and that the outcomes will be more predictable in function of the initial plan. In other words, well-planned projects are more controlled and, as a result, more likely to achieve their objectives. The reverse should also hold true.

It will be seen that, while our evidence confirms both hypotheses in their general orientation, the problem is far more complex than it appears. In particular, the *inclusion* of comprehensive planning data does not ensure that the data are reliable, and the cycle of operations is susceptible to so many external influences that the predictability of the outcomes cannot be attributed uniquely to the quality of the planning.

No planning, minimal planning and detailed planning

Although there are gaps in the information we were able to gather the relationship between any given plan's components, operations and outcomes tends to confirm our hypothesis. If the data are simplified slightly, three global patterns seem to emerge among the projects studied:

1. near-absence of planning (few components present from the list given above) → several short-cuts in the problem-solving cycle (as depicted in Figure 28) → great numbers of unexpected outcomes or serious problems during implementation;
2. minimal planning → few short-cuts in the cycle → moderate number of unexpected and problematic outcomes during implementation;
3. detailed planning → no or few short-cuts in the cycle → low or moderate number of unexpected or problematic outcomes during implementation.

No or little planning. These projects contain few of the components from the list on page 138, and those that are present are usually not elaborated on. The need for change is defined in some detail, and there is a list, rather than an analysis, of expected benefits. Estimates of manpower and material requirements are absent or are avowedly approximate. All organizational structures and strategies are limited to naming appropriate ministries or officials. Evaluation is not mentioned.

With relation to the rational problem-solving cycle (Figure 28), there is a clear tendency to leap from the subset of needs to the fabrication of solutions, and from there to widespread or national application of solutions. Accordingly, the number of obstacles encountered is inversely proportionate to the length of time spent preparing for them. Often, there is an appeal for external assistance in moments of crisis, in the hope of helping the project by injecting more personnel or materials.

To some degree, this profile is a variation on the first project type described in chapter III, although it would be a somewhat extreme version of that type. Alternatively, this profile characterizes only one phase of a long-term project which was later reorganized. To illustrate this, rather than following any single project through all the stages, it might be more useful to look at analyses of innovations which report typical patterns at some stages but which do not necessarily conform to the overall profile.

> The original selection of entrepreneurs to be assisted was apparently random... The Oweri centre developed merely on a trial-and-error basis, and action taken at the Zaria centre was partly determined by this experience... The greatest weakness in all the activities described appears to be over-all lack of plan in terms of needs and potentialities and relying on 'intuitive' planning based on uninformed demand (leading to overinvestment in corn and rice mills). There is no machinery for identifying underinvestments in fields that have not caught the imagination of would-be entrepreneurs or young skilled workers. (5)

> The project's effectiveness was reduced by... excessive generalization, all inclusive objectives and probably too vast a scope. This hurt explicit project development and was responsible for a number of problems in the course of project implementation. (6)

> The original targets have been trimmed toward more realistic levels, but it still appears that an excessively wide audience coverage is being sought at too fast a pace for a programme that is thinly staffed and is supposed to be experimental in nature. The inclusion of as many people as possible in the early courses, without regard to their motivations, practical needs, potential uses of literacy, and the continuous availability of relevant reading materials is an invitation to poor quality and low effectiveness. (7)

> The evolution of the camp system has demonstrated an interesting lesson on the danger of extending a programme devised initially to meet a given set of circumstances that have changed their nature.
>
> The initiators of the system in the mid-1950s did not view their new departure as either a long-term or large-scale programme. The prevailing opinion was that a strong and expanding formal school system would soon provide a full and adequate preparation for all young folk. The camps therefore were designed to fill a temporary role and pick up what was confidently expected to be a rapidly decreasing number of youngsters who had missed their schooling through no fault of their own.
>
> Ten years later, when this premise proved to be unrealistic, a hurried groping for a feasible alternative to the school led to the decision to expand the camp system without considering its appropriateness in the light of the magnitude of needs of alternative ways of meeting them. (8)

Minimal planning. A great many of the projects studied here fall into this category, particularly those receiving moderate to large amounts of technical assistance. Providing a plan for implementation is very often a pre-requisite for assistance on the part of bilateral and multilateral agencies.

These projects are characterized by a wealth of quantitative data, by statistical rather than analytical estimates of benefits and requirements and by a lack of the more qualitative components mentioned on page 138. Financial costs, manpower and material requirements, organizational structures – without specifying each step – are indicated, sometimes in detail. However, needs are somewhat rapidly justified, and objectives are rarely specified. Expected outcomes, non-financial costs, evaluation procedures and strategies of diffusion are either summarily treated or absent.

The basic weakness in this pattern lies in its imbalance. In particular, if needs, objectives, expected outcomes and benefits are incorrectly or superficially diagnosed, other components become virtually useless. They serve only to make precise a number of organizational specifications and material requirements for executing an imperfectly conceived project. Imperfectly conceived projects inevitably run into problems during and after implementation, since they are based on an incomplete or erroneous assessment of their environment. In imperfectly 'predicting' the behaviour of that environment, one is less well prepared to 'control' one's own or others' actions within it.

Following are illustrations of two typical weaknesses in this pattern: insufficient analysis of needs and imprecision in defining objectives. First, two examples of inadequate assessment of needs, one in a Latin American and the other in an Asian informal educational project:

> In the planning of rural manpower planning... it was made clear that the PPPR must seek to improve the fit between its courses and the particular characteristics of the community... One important element of preplanning in the view of the team members – the assessment of markets for those products being encouraged by the training programmes – was lacking in both areas. In the North, for example, participants in a citrus fruit course reported that they were unable to market the citrus fruit they had been taught to grow. (9)

> In summary, the employment effect of the training programme, as indicated by the sample survey, is that a little over half of the graduates were holding some sort of full-time or part-time employment and less than half of this group were using in their jobs the skills learned in the MTTS.
>
> Although the nature of many of the skills taught and the rural economic condition dictate that many of the graduates should become self-employed entrepreneurs, no element of entrepreneurial and managerial training is included in the programme. Neither is the programme linked to any public or private service facility that could offer such training, or credit, technical supervision, and advice for small rural enterprises. (10)

These quotations show clearly that if the assessment of needs is incomplete or incorrect this will invalidate much of the effectiveness of the project. The second weakness can take several forms: (a) the objectives are not specific, (b) the objectives are not operational, or (c) the objectives are not in line with the stated needs. All forms appear in the case study literature and project evaluation reports. A number of the obvious dangers are reviewed here briefly:

- not specifying what is precisely to be attained can result in contradictory practices in different settings, or even in practices opposed to the rationale behind the project;
- imprecise objectives make leadership either very difficult or arbitrary. If operations are not clearly specified, leaders do not know what to tell the people to do;
- people tend to 'play it safe', to do what they have always done – which decreases radically the margin of change;
- the possibility is opened of following blindly or passively a plan of operations which may be manifestly aberrant but which is the sole guide for appropriate action;
- it is impossible to monitor the progress or measure the success of the innovation.

To cite from the evaluation report of a North African project, which incorporates several of these aspects:

> A major source of problems in this project was that its broad, long-rang objectives were not translated into specific, operational objectives... These are nowhere spelled out in the project document itself. Eventually, (as a result of confusion and delays in implementation) short-term objectives, capable of being evaluated directly, were formulated... They became logical tools toward the attainment of the long-term objectives of the project. (11)

Similarly, in the survey results, we can see the pattern of imprecise objectives and fairly precise plans for implementation. Specific plans for implementation were 'clearly' formulated in 70 per cent of the cases (with 32 per cent of these in 'great detail'), but *objectives* were 'very precisely' formulated in only 33 per cent of the cases, and 'generally' or 'vaguely' defined in 43 per cent of the cases.

Short cuts in the problem-solving cycle. Minimal planning is often, but not always, associated with a particular cycle of operations as illustrated in Figure 28. The longer, more comprehensive cycle tends to be shortened at two points. First, there is a tendency to jump from a diagnosis of problems to the identification of possible solutions without a long or careful quest for solution ideas. We have seen that all project types, but in particular the first two, are subject to this foreshortening of the cycle. Secondly, there is the widespread and well-documented practice of bypassing the pilot or experimental phase, i.e., of applying solutions without trying them out. This practice stems from the perceived urgency of the needs. The dilemma is a real one: how to bring about rapid and widespread change while recognizing the necessity of a trial period or a small-scale experiment. Lallez treats the question at length in his study of the IPAR project in Cameroon. Here the number of schools to be involved was carefully selected, in order to avoid the extremes of generalized implementation and a small, rigorously controlled network of pilot schools. However, while controlling for this one level, the same problem reappeared at another when the programmes, lessons and materials to be introduced into the network of 230 pilot schools were not sufficiently field-tested. (12)

The same dilemma appears in this account of an African literacy project:

> But our biggest defect was the lack of testing and experimentation. No primer has been tested. Testing a primer and revising it takes time, and to do it we must have flexibility in printing schedules. In fact, we have been caught short each season, and the feeling was: better to have a defective primer than nothing. (13)

Detailed planning. Our sample includes few projects in which most or all of the necessary components in planning are both present and detailed, and in which the full problem-solving cycle is followed. However, as stated earlier, highly industrialized countries do not provide many examples of this pattern either. Judging from what examples there are, it does appear that fewer problems are encountered during implementation as a function of the caution used, and the meticulous detailing of operations into small steps. The attainment of initial objectives is also greater than in less well planned and more rapidly or massively implemented projects. (14)

In one project evaluation report of a Caribbean regional teacher training and curriculum development project, smooth implementation and successful results are attributed directly to the presence of four of the components listed on page 138: careful diagnosis of the needs, specificity of the objectives, detailed organizational planning in direct relation to the objectives and 'the development of competencies and materials which are derived from a set of strategies for innovation'. Two further citations from the report are explicitly pertinent here:

> While there are limits to the specificity with which objectives can be tested in a plan of operations, (this project makes a clear case for the usefulness of)... establishing a set of performance goals for a project in terms of what the regional and national agents will be able to do as a result of project action; such a measure of 'capability' offers them more tangible goals and means of assessment.

> The structural and organizational aspects of the project were delineated from the beginning by a series of flow charts and matrices which assisted in reducing the complexities... and making the exercise meaningful.

Similarly, Schramm mentions the careful planning and gradual, experimental introduction of the instructional television project in Niger. In so doing, however, he again underlines the dilemma of care (which takes time) versus perceived urgency of need:

> Three of the four (instructional TV) projects, (Niger, Ivory Coast, El Salvador), Samoa excepted, moved at a careful and measured pace into their reforms. The fact that Samoa did not gives us an interesting point of comparison.
>
> The production team in Niger tried out all its television programmes, by closed circuit, on two experimental classes during the 1964-65 school year. At the end of this time, the team found it desirable to remake, in whole or in part, about 80 per cent of the programmes. During the second year, the revised programmes (about 400 per school year) were presented to 20 first grade classes (800 students), and second grade programmes were tried on the two experimental classes. In the third year, the second grade programmes, revised as necessary, were presented to the 20 classes, while new third grade programmes were tested on the two experimental ones. At this careful pace, the project moved through the five elementary grades. (15)

One noteworthy aspect of this project was the fact of its never being expanded beyond the initial 20 classes. This seems to indicate that either careful planning does not preclude unforeseen problems of finance or resistance or that the planning was *not* comprehensive, in that the problems involved in wider application were not identified at the outset.

PLANNING AND BARRIERS TO SUCCESSFUL IMPLEMENTATION

In a substantial number of the projects analysed, implementation was hampered by many obstacles. These obstacles differed in kind and degree of seriousness according to the type and setting of the projects. We are now interested in seeing how many of these obstacles could have been *avoided*, or *anticipated* (and therefore prepared for and probably reduced) by more careful and reliable planning. In other words, how many of the barriers encountered in implementation can be attributed to errors in planning and how many to external factors which comprehensive planning cannot anticipate or control?

It is extremely difficult to see a clear anwer to this question. No factor can be completely isolated, and only the rare, closely documented case study could hope to show the complexities in the interactions between errors in planning and external factors.* We can try, however, to formulate some tentative answers by looking, in particular, at the survey responses and the few 'process' analyses available in the case study literature.

First, to pose the question in more operational terms, we will interrogate the survey results. As mentioned earlier, clear plans for implementation were specified in 70 per cent of the cases. However, 'major revisions' were necessary in 46 per cent of the cases. On the list of 99 barriers to implementation, each of the *items* was checked as having been observed by at least some of the respondents. Nearly half of these barriers had constituted a 'serious' or 'very/extremely serious' problem. That is to say, despite the appearance of careful planning, there is evidence of a great number of projects which cost more and take longer than expected, which must be reduced in scale or applied elsewhere or in another form than initially planned, etc..

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* R. Lallez's two accounts, one of the IPAR project in Cameroon and the other concerning the CER project in Upper Volta are among the few detailed case studies in which the *process* of change is chronologically analysed. However, even these accounts are limited by the fact that they are *ex post facto* and written by someone whose familiarity with the setting is necessarily restricted.

In trying to identify the problems which could have been avoided or lessened by more comprehensive planning, we will begin by dividing them into three large, overlapping categories:

1. problems due to weaknesses in the infrastructure or procedural configuration, many of which could have been anticipated, lessened or even avoided by more careful, realistic planning;
2. problems due to dependence on external systems, notably technical assistance agencies, some of which could have been resolved through more careful planning;
3. problems due to either situational factors, in particular cultural and psychological variables, of which many could have been anticipated and reduced by a more 'adaptive' or more 'responsive' cycle.

Procedural weaknesses

We are referring here to a disequilibrium between, on the one hand, the provisions and estimates in the plan, and, on the other, the capacity of the country, province or institution to *provide* these elements reliably and in sufficient quantity. This problem of disequilibrium is one of the basic themes in our study. The bulk of our evidence indicates that the capacity to successfully implement innovations is very often inferior to the requirements implied by the project objectives. Much of our analysis has centred on *how* this happens in various settings and *why* it happens. What concerns us now is: why does planning often appear to exacerbate this problem of disequilibrium rather than to alleviate it? Since the very *function* of rational planning is to reduce the disequilibrium between system goals and system capacity, how does it happen that the results are so often unsatisfactory?

Ambition. This term, as we have seen, accounts for some of the disequilibrium. But while 'ambitions' can explain why intentions or *objectives* are high, it does not explain why the *plan* is unrealistic. For example, one *may want* to train 250 new teachers to meet urgent needs of overcrowding in the classroom, but if there are only 50 qualified candidates, and no budget increase for additional personnel, one would normally *not* plan to train that many. Our suggestion is that, for a number of reasons to be mentioned, many of the plans appear to overestimate consistently the capacity of the educational system to attain its objectives. *To a great extent planning is less based on estimates or analyses of available resources, than on aspirations.*

This phenomenon is well-captured in an interview with a team which comprised an experienced external adviser and an African 'counterpart' from the ministry:

> Q. Was the project very ambitious?
> A. Yes, very ambitious, too ambitious. We didn't have the structures behind us to carry it out, and we knew that in advance. But we decided to go ahead with the plan anyway.

The survey responses provide comparable evidence, with the reservation that response bias very likely skews the result in a more conservative pattern. In reply to the question, 'In your opinion, were the official objectives of the project realistic?', only 5 per cent judged the objectives 'not very high' as against 59 per cent who felt they were 'very' or 'extremely high'. Of these, 23 per cent felt that their objectives were 'probably unattainable', and we suspect that for many of the remaining 36 per cent who checked 'very high but attainable', the objectives were also 'probably unattainable'. This suspicion is partially confirmed by the interviews, where well over half the respondents spoke of unrealistic objectives.

We have then the very paradoxical constellation of fairly precise plans (analyses, estimates and specifications) for implementing a project which has little chance of being implemented as planned. The project cannot realistically meet its objectives in the time allotted, nor with the actual – as opposed to the estimated – amount of personnel, materials, funds and facilities. As a result, projects run into numerous obstacles: delays, insufficiencies, resistance, discouragement, conflicts, too rapid or superficial performance, and the like. This general pattern, + unrealistic planning → lack of preparation, is well reflected in the responses to the survey question, 'was there inadequate consideration of problems of implementation?' Fifty-five per cent of the respondents felt this to be the case, and, again, this is probably a conservative figure considering (a) the number of barriers encountered, and (b) the seriousness of these problems as highlighted in both the interviews and the project evaluation reports.

Here are a number of possible explanations for this phenomenon, which we shall discuss in some detail:

- political pressure resulting from the perceived urgency of the needs – pressure based on either idealism or 'naïveté';
- unreliable or unavailable data for planning as well as a tendency not to consult the data which are available;
- an attempt to attract more external assistance, as well as the complicity of these external agencies, which are particularly interested in large-scale innovation;
- confidence that the educational system can adapt well in problematic situations or situations which have not been prepared for;
- a belief that the political and organizational situations in the country are too volatile to warrant careful planning.

Our evidence suggests that all these explanations are operative in varying degrees in the projects studied. To illustrate the first factor on the above list, here is De Wilde's analysis – confirming the prior evaluation by Lynton and Stepanck – of an Asian non-formal education project:

> In the enthusiasm and concern for promoting development in the more remote and backward areas, efforts to encourage rural industrialization have tended toward excessive dispersion in terms of both the range of industries and units and the entrepreneurs that have been assisted. There has been insufficient discrimination in the selection of entrepreneurs and the types of industries. Inadequate attention has been paid to staffing constraints and the limitations governing rural industry. (16)

Naik, in his very perceptive essay, captures the same point on a more 'microscopic' level:

> An important point to be emphasized in the institutional plans is their successful implementation. A common tendency is to make ambitious plans which sound good on paper and then to implement them indifferently. This trend is also encouraged because the inspecting officers often compel schools to undertake a number of programmes. This begins ineffective implementation, inefficiency, and slip-shod work which undermines the utility of this programme which is essentially qualitative. To avoid these weaknesses, it should be clearly laid down that ' not low aim but failure is a crime'. It should be left open to the schools to make small plans, if they so desire, and no attempt should be made to force ambitious plans on them. (17)

The following citation from an interview with an African ministry official responsible for teacher education points out how the factors listed above interact with each other:

> Yes, (there is a definite problem of overambitious objectives). Demands coming from government officials are often too ambitious, too optimistic. I even catch myself doing the same thing. And

> the outside experts don't contradict this when we go over the planning information together. In fact, *they* formulated the objectives for (this particular) project. But we only have outside funding until the end of 1976, and many of the objectives will not have been met by then, so that there is the real danger that only 'relics' will remain. More modest objectives could have been met.

Finally, to cite from Lallez's remarks on the literacy component of the CER rural education project in Upper Volta:

> The unsound, precarious results of literacy teaching are no doubt attributable to the fact that the CREDIF method is insufficiently adapted to the population concerned and to the latter's vernacular languages. It is therefore also attributable to the rural teachers' lack of training in the method they should use. Equally clear is that these explanations, largely technical, can only be partly valid. In fact it seems impossible to question the ultimate failure of the literacy teaching without questioning the validity of the objectives it was intended to attain. Would it not have been more reasonable, even necessary, to measure more accurately what was attainable, by any method, in three years' learning in given conditions and with the means available? (18)

The inverse relationship, showing how more realistic planning leads to smooth implementation, is illustrated in this quotation from an interview with a Latin American official:

> Q. Were the objectives too ambitious in relation to the resources?
>
> A. No. There was a very good pre-project planning team for this project, and they worked very carefully. Both the global objectives and the performance objectives were realistic. By the time there was a mid-term evaluation, there was no need for redirection in the project.

It seems obvious that, were the pre-planning data actually used for decision making, many countries would probably never have gone ahead with their projects. As shown in chapter III, notably in the first and third project patterns ('alternative of grandeur' and 'crusade'), the urgency of the needs, the political pressure to act qucickly and signficantly, and the popular mandate for change all create an atmosphere favouring a 'breakthrough' and it is very difficult to dispel this with statistics. It is precisely in such an atmosphere that 'aspirations' become 'plans'. The hope of more resources than are actually available makes these resources become real enough to be included in the estimates and provisions. This is, in fact, an integral part of the strategy of implementation in the 'crusade' type of project – where new resources are generated in the form of volunteers, donations of local services and facilities, and where material sacrifices are made for the ideals behind the project. As shown earlier, this strategy can be largely successful under certain political conditions. It is, however, very risky to 'plan' on potential resources which are not, and may never be, available.

Unreliable, unavailable or unutilized planning data. Incomplete or unrealistic planning can be partially explained by the fact that: (a) key data on available and likely resources, outcomes, costs and requirements do not exist at the time of planning; (b) these data are not accurate; (c) these data exist, whether reliable or not, but they are not consulted.

Some concrete illustrations may be drawn from three crucial types of planning information: analysis of expected costs, analysis of available materials, estimate of skilled manpower available for the project. Most plans routinely include these data, since they are precise indicators of the available and required resources for successful implementation.

In a considerable number of project, costs appear to have been consistently underestimated, either because the estimates were not made, were inaccurate or were ignored. This is particularly crucial in that many of the large-scale innovations are designed to be less costly than the traditional programmes. In the survey, 60 per cent of the respondents observed that 'costs were generally underestimated even without considering the effect of inflation'. Similarly, after indicating that the Jamaican residential camp system was designed to be an economic alternative to formal schooling, Prosser reports:

> A major constraint on a greater rate of expansion has been the costs of the programme. Both capital and recurrent per capita costs were very high in comparison with those of primary schools: camps were at least ten times more expensive. In no small part because of the residential nature of the camp system. (19)

Lallez makes a comparable analysis of the respective costs of the formal primary school and the innovative, presumably more economical, rural school network:

> Considering, on the one hand, the respective durations and enrolments of the two types of education, and, on the other hand, the fact that the greater part of investment expenditure for the CERs was extra-budgetary, the new system will be presumed to be clearly more costly than had been foreseen. Actually, whereas the estimates underlying some of the arguments of the initial conception set the average annual unit costs in rural education at half what it was for traditional primary education – 6,530 CFA francs as against 13,320 – while the schooling was to cost five times less, in fact the expenditure amounted to 8,020 CFA francs, while for ordinary schools it was only 10,420 CFA francs. (20)

This theme is treated more analytically in one of the interviews:

> Very often, statistics for the plan of operations are very approximate or even invented. The basic information isn't there, but we have to provide it in the plans, so we do our best with what we have. For example, we tried to calculate costs on a new project by using the auditing system of another project with a lot of similar requirements. But we found out that there wasn't what you would call a usable filing or auditing system.

With regard to materials, 65 per cent of the respondents observed that they were of 'insufficient quantity'. This factor is logically related to cost estimates, as illustrated in the evaluation of an Asian project for the creation of an institute of education:

> There is some cause for concern over the financial inputs concerning curriculum development. It is likely that the government was not fully aware of costs of the implementation of a secondary curriculum on a nationwide scale... Even if the money is made available, the logistics of production may well find us short on printing capacity and even materials.

Similarly, Tsala reports that the IPAR project in Cameroon was held up for nearly two years because of over-ambitious estimates of how long it would take to have sufficient quantities of new teaching materials available. (21) Since many other aspects of the project depended on the new materials (upgrading of the existing corps of teachers, installation of the new study plan, location and creation of facilities for the new schools), these delays had a chain effect, thereby inflating later costs.

Finally, the extent of the problems stemming from incorrect estimates of needs for trained personnel are reflected in responses to the survey question: 'Is there lack of skilled manpower to implement the project as planned?' The answer was 'yes' for 72 per cent of the responses; it constitutes a serious handicap in 64 per cent of the project evaluation reports, and it invariably figures in the case study literature. Even where authors describe a project as 'carefully planned', there are often insufficient numbers of students, instructors or supervisors. (22) By way of comic relief, here is a relevant excerpt from an interview with an external adviser in a Latin American technical teacher-training project (who on his own admission found it difficult to integrate himself fully in the project operation):

> We were supposed to train 240 students a year as of 1971. No one could explain to me why it had to be 240. We only had about 120 in 1972 and 1973. In 1974, we were told again to plan for 240, but we had only 28. But at the end of the year, the architect told us that we had to change our plans because we were going to have 370 instead of 240.

Finally, in somewhat the same vein, here is an excerpt from the Unesco assessment of the Experimental World Literacy Programme:

> Another country originally planned to place at the disposal of its EWLT project 150 agricultural agents, i.e. more than existed in the country at that time. Probably, this was because the original planners did not consult all the ministries concerned, or go through a central planning body. (23)

Instability and procedural unreliability. In the previous section, we have analysed some of the problems encountered in implementing innovations which could have been foreseen or eliminated by more realistic planning. That this was *not* done as often as it might have been is due both to political factors and to weaknesses in the problem-solving infrastructure. The political factors can act so as to create planned unrealism, which translates later on into delays, insufficiencies, lower quality performances, etc..

In other words, more careful or realistic planning would have avoided or decreased problems related to *resources* (personnel, materials, funds). The relevant estimates consistently indicated that there were greater resources available than usually proved to be the case. But the lack of realism also lies in the estimations for the delivery, co-ordination and quality of these resources. That is to say, the plans over-estimate the capacity of the infrastructure to provide reliably all the procedures necessary for successful implementation. In fact, the unreliability of the plan itself is symptomatic of this very problem. To given an example from an African project evaluation report:

> Both at the Federal and State level, the preparation of the plans was the reult of an unco-ordinated series of actions conducted at different levels of authority and often involving reversal of important policy decisions... For instance, the projections for universal primary education and for the development of secondary education had to be redone several times following statements or decisions which changed time of implemenation, mode of financing, transition rates envisaged, etc.

Another central point made in this book concerns the relationship between a system's goals and its capacity to process all the messages and connexions needed to attain these goals. The more ambitious the goals, the greater the number and complexity of operations and, consequently, the more elaborated the procedural infrastructure that is needed to service them reliably. The number and seriousness of problems of communication, co-ordination or decision making, and the delays or insufficiencies resulting from them, are indicators of overestimates of the problem-solving capacity of the education system. These over-estimates can be traced directly to a faulty appraisal of the organizational structure, which in turn produces an over-optimistic schedule of operations for the project.

The survey responses help us to analyse this problem in a simplified way. We have extracted items that refer specifically to weaknesses in the infrastructure (which was probably overloaded by the ambitiousness of the objectives). There is, of course, some overlapping in the weaknesses mentioned, e.g., 'centralization' is also illustrative of a communication problem (difficulties in getting information to and from decision makers).

Table 5.1 requires little comment. These problems are all frequently observed, and often judged serious. The fact that the items least sensitive to response bias (delays in materials and slow transport) are ranked highest on both scales suggests that scores on the more sensitive items (e.g. those under 'decision making' and 'communication') are conservative. Confirmation is found in the project evaluation reports, where 73 per cent of those sampled record 'insufficiently clear structures'.

TABLE 5.1. Responses to selected survey items illustrating problems of procedure (in percentages)

Type of problem	Illustrative items	Questionnaire responses (in percentages)	
		problem observed	problem judged 'serious' to 'very/extremely serious'
Decision making			
	Delays in formal authorization	42	26
	Lack of clear lines of authority	42	17
	Insufficiently clear structure for decision making	53	30
	Too much centralization of decision making	54	30
Co-ordination			
	Not enough co-ordination of people in different roles	57	43
Communication			
	Lack of common understanding of project objectives	59	38
Resulting delays or insufficiencies			
	Materials not ready or not delivered on time	79	57
	Slow transport of materials	92	69
	Means	57.6	37.1

As further examples, we include here three illustrative passages taken from the case study literature, project evaluation reports and interviews:

> ... the problem of excessive centralization. All the important decisions are made by a few key people. They appear always to be either busy or out of town. This leads to delays in execution... (24)

> There were conflicting decisions made between the different ministries which co-ordinated the project. It was less a problem of disagreement than that communication was very poor between them. (25)

> The action of representatives of the Ministry of Development and Health was nearly always marginal, and as was seen at the base, it always depended more on their goodwill than on their statutory position. Within the Ministry of Education itself, the existence side by side of two Directorates, of Rural Education and of Primary Education, responsible for two different systems of training, was bound to raise a number of problems ... (26).

Political and institutional instability. The problems just discussed can all be linked directly to inadequacies in the planning process. There are, however, other problems of procedural unreliability for which planning can only partially allow. But since such problems occur with great frequency, it might be inferred that they can be anticipated, even expected. We refer here to problems of *instability* at the political and institutional level.

These are perhaps the most crippling problems in the management of innovations, in that they weaken not only the infrastructure but also the authority or leadership in the project. One of the clearest relationships we have found in the analysis is that between continuity in leadership and more successful implementation. (27) The relative success of the 'crusade' project type described in chapter III is very much a function of strong and consistent leadership during the life of the project. This is also the case in local or small-scale projects which often depend greatly on the energy and commitment of a single person. (28) But local innovators are very committed personally to their innovations and are therefore likely to stay with them through the period of implementation. Large-scale innovations are often part of a political platform. If this leadership changes, the new leadership is not likely to place the same innovations in *its* platform, so that many projects are left without continuing support. When *both* leaders *and* staff change during the course of a project, there is a weakening in all three dimensions of our model: infrastructure, authority and consensus.

In the survey, the problem of 'changing governments [which] makes it more difficult to maintain consistent policy and to follow plans' is observed by 30 per cent of the respondents and considered 'serious' or 'very/extremely' serious by 19 per cent. This same problem is cited in 36 per cent of the project evaluation reports. Furthermore, the related problem that 'departure and replacement (turnover) of key persons in the project (hindered) continuity' is observed by 49 per cent of the survey respondents, and considered 'serious' or 'very/extremely' serious by 26 per cent (as compared to 36 per cent of the project evaluation reports).

By way of illustrating and documenting this problem, we present below several converging evaluations taken from different sources:

> There were changes in government policies, programmes, personnel and procedures... (and) constant changes in government personnel during the three and a half years of the project. (29)

> Continuity of staff, including staff supplied by overseas aid, is equally necessary, but not always easy to achieve... But staff turnover in African schools and universities remains high, and the danger of many different staff becoming involved in the operation for too short an average time remains a very real one. (30)

> Directors change every two years or so, and so do ministers and ministry officials. There is no stability in our projects, so we are constantly improvising. Note that this too allows us to innovate sometimes. (31)

> Soon after their inception (that of a new Youth Corps, local non-residential youth clubs, paid government youth organizers, and a new parent Youth Club Council), however, the responsibility for these activities was transferred to the Ministry of Housing and Welfare, because these were considered welfare activities rather than educational. In 1963, following a change of government, responsibility was again transferred with 'welfare' as a ministerial portfolio joining 'development' in a ministerial reshuffle. (32)

We do not have sufficient empirical evidence to explain *why* there is so much political and institutional instability, nor is this explanation crucial to the point we are trying to make. There are undoubtedly a series of reasons such as: lack of a sufficient number of well trained, senior administrators, leading to shifts from one high-priority post to another; political instability resulting in constant changes at the ministerial and provincial levels; use of project director and even ministerial posts as stepping stones to positions with more prestige or remuneration, etc.

The existence of a high rate of instability may, to some extent, justify a less elaborate planning mechanism. If follow-through is subject to so many unknown and uncontrollable factors, a comprehensive plan may be more decorative than functional. That such factors are *likely* to appear and to disrupt project continuity is, however, a good argument for reducing the number of large-scale innovations, where the consequences of turnover are so far-reaching.

Lack of formative evaluation (monitoring). Comprehensive planning usually includes three critical components:

(a) a list of problems which could appear in the course of implementation;

(b) a provision for *collecting* and *transmitting* information which indicates whether these problems are occuring, and in what form; that is, whether or not the project is progressing in relation to the prescribed plan of operations;

(c) a provision for mechanisms which allow project personnel to discuss this information and to deal with unexpected problems (time allotted, special meetings or 'retreats', etc.).

When these components do not appear in the plan, we can anticipate the following:

- an increase in the *seriousness* of unexpected problems, since they have not been anticipated at the outset and are registered only when they have become critical enough to threaten implementation;
- an increase in the *number* of conflicts, since the information is generally passed by word of mouth and regular communication is not provided for;
- a decrease in the energy available for carrying out the project, since so much energy is used up in dealing with unexpected problems or in extra time for unscheduled meetings. In systems language, we would say that there is too much 'maintenance energy', and too little 'effective synergy'.

In fact, planning in a situation where it is known that the political, institutional and procedural infrastructure is unstable should *centre on* the three components listed above, since so many and different unexpected outcomes are likely to appear in the course of implementation. Of course, as logical as this proposition may be, it is unfortuntately also unrealistic. As we have seen, comprehensive planning is itself *part* of a highly elaborate and reliable infrastructure.

Another argument for including a monitoring mechanism in the project plan lies in the *scale and novelty of the innovations* themselves. These are often large-scale projects and nothing like them, even on a small scale, has ever been tried within the country. This increases the chances that a lot of unexpected things will happen and also that most people concerned with the project will have had little or no prior experience with the kind of changes being made. All the more reason, then, to anticipate and provide for adequate time and help. Otherwise, the project can be seriously compromised. In one well documented study of the change process in an urban primary school, the failure of the innovation is largely attributed to the lack of special mechanisms for monitoring and treating unexpected difficulties:

> The director's strategy for implementing the innovation gave practically no consideration to the potential obstacles that were likely to arise when the teacher would attempt to implement the new role model. Since the director's model for change essentially ignored these potential problems, no efforts were instituted prior to the introduction of the innovation to remove or minimize these barriers, nor was attention focused on ways to cope with them if they emerged during the period of attempted implementation. (33)

Finally, the commonly noted *lack of clarity in project objectives* often means that there are contradictions or incompatibilities in the project which have been masked at the planning stage in order to permit more rapid implementation. When no separate provisions are made for the treatment of these contradictions or incompatibilities when they appear – and they invariably do during implementation, there is a real danger that project personnel will devote practically *all* their available time to resolving them, while project execution is virtually suspended. A striking example occurred in the IPAR project as chronicled by Lallez. (34) The incompatibility between the vocational and more scholastic components in the study plan emerged at a moment when the entire mechanism (teacher training, preparation of materials, implementation in hundreds of classrooms, etc.) was operating. But the problem was so significant that it had to be resolved, and this had to be done by diverting the people and their time from executing the project.

In our sample, the plans of very few projects included such a list of possible problems, with provision for systematic data collection or special mechanisms to assess progress and treat obstacles. Not even the frequent presence of external advisers who usually demand more careful planning as a pre-condition for assistance, seems to have changed this situation.

For example, in only 27 per cent of the projects surveyed, were criteria for evaluation specified in writing (the 63 per cent rate for Latin American projects was significantly higher than elsewhere). Systematic data collection was undertaken in only 26 per cent of the cases (the Latin American rate being 46 per cent). Specific mechanisms for monitoring the project were provided for in 26 per cent of the cases, but these mechanisms appear to have been mostly limited to formal meetings between senior staff members, or to periodic inspection missions by national or international officials.

Such considerations bring up the problem of centralizing ongoing evaluation. Such centralization can mean: (a) treating the relevant information only after the problems have become very acute; (b) not being aware of many difficulties; (c) hesitating to channel upwards information which is not favourable. Here lies one of the greatest problems of centralization: the locus of decision making is far removed from the locus of its consequences. This means that decisions tend to be based on less information and they are more cut off from feedback as to their consequences.

Predictably, one of the most comprehensively planned, carefully executed and apparently successful projects in our sample, a Caribbean regional teacher training and curriculum development project, included a number of provisions for monitoring. To cite from the project evaluation report:

> As much attention (was) given to building evaluation and feedback elements into the ongoing programme of training and production as to periodic or terminal evaluation procedures.

Sketch of an alternative model for planning

To conclude here, what are some of the implications of an unstable environment for planning innovations? Given instability in the organizational infrastructure, what kind of planning is, theoretically, optimal? A tentative discussion of this may help in devising a more realistic strategy of innovation.

First, let us take the case of a country where political leadership and institutional responsibilities can be expected to change in the course of the project; then let us assume that procedures (co-ordination, communication, decision making) are not always reliable; that there is a tendency to try to accomplish more than the infrastructure can realistically cope with; and that much of the data need to plan solutions are unavailable or inaccurate. At this point, we can already say that the plan itself is likely to be unreliable. Drafting a comprehensive plan of operations under such conditions is therefore more an *exercice de style* than it is functional. It only serves to satisfy the demands of others – notably external assistance agencies.

In this situation, it would seem more useful to concentrate on the assessment of the needs and the transforming of those needs into various kinds of alternative solutions. The details concerning these solutions and the implementation plan (precise estimates of requirements, specification of organizational structures, specification of step-by-step operations would be unnecessary – since it would very likely prove to inaccurate *a posteriori*. This is the *opposite* procedure from the one so frequently observed in our sample, where the requirements and organizational operations are far more detailed than the assessment of needs or the justification of the solutions adopted.

In assessing needs for change and possible solutions to those needs, the accent would be put on 'personal' sources of information. The number of face-to-face meetings between officials and local or institutional delegates would be multiplied, as would the number of 'negotiations' concerning possible solutions. Emphasis would be placed on project objectives being clearly understood and acceptable to the people involved. As shown earlier, when communication is frequent and complete between national, institutional and local representatives, both the diagnosis of the genuine needs and the formulation of *appropriate* solutions are likely to be more accurate and sensitive.

The project objectives would gain by being specific and operational, but this is not indispensable if the preceding cycle of needs assessment and solution design has been carefully done. The objectives should, however, be relatively modest. As a rule of thumb, the scale of the project would be reduced by half, or it would be divided into two separate projects. The rationale behind such a decision would be that: (a) there is a threshold of numbers and varieties of problems beyond which procedural instability creates an unmanageable situation, (b) with smaller scale innovations, all concerned can monitor quickly and without intermediaries most aspects of what is happening, and (c) the break up or reduction in scale of a major innovation makes for easier adaptation to different local settings. To illustrate how following such a pattern can prove helpful here is a commentary on the Sudanese functional literacy project in the Unesco assessment of the Experimental World Literacy Programme:

> What limited success the project realized in this and other areas can perhaps be attributed to the Government's commitment to the project (and to functional literacy in general), to the 'custom-tailored' nature of the various sub-projects, the smallness of the administrative bureaucracy, which enabled it to act and react quickly to project demands, and the small size of the learner population itself, which enabled more thorough training of literacy instructors and preparation of literacy materials than was the case in most other EWLP projects. (35)

Continuing with this alternative model, specifications of personnel, materials, facilities and funds would be approximate. This would involve more than the usual latitude and flexibility from external assistance agencies. For example, material assistance would come in a lump sum at the outset of the project, and there would be a pool of available expertise for fixed periods of one to two years – people who could either move from project to project, or stay longer on one project as needed.

Implemenation would then adapt to the evolving situation rather than being bound to a plan of operations. In many cases, this seems to be already happening, and given the amount and seriousness of the obstacles encountered, the adaptation appears to be extremely effective. A number of projects in our sample, which would have been discontinued or drastically reduced in scale in highly industrialized countries because of difficulties of implementation, are successfully completed. This is accomplished through flexibility, improvisation and very rapid adaptation. To cite from two interviews, one with an African national official and the second with an expert of a large-scale Latin American teacher education project:

> Yes, there are a lot of unexpected things happening, more than the expected things. We try to be ready for *anything*, to remain very flexible. Projects don't depend on plans. They depend on people, on the hierarchy of functions, on conflicts. The situation can change from one day to the

> next, and we can't predict two or three years in advance. What finally happens depends on the structures created by the people on the spot, not on plans or even decisions made elsewhere.
>
> Prognosis is never *factual*. There is a distortion between the forecast and the plan on one hand, and the real situation on the other. Everyone knows what the real situation is and that it doesn't connect very well to what is *supposed* to be happening. But I have to admit that very often it comes out all right in the end. Not the way it was planned and not even *what* was planned, but all right. They are very pragmatic. They adapt.

Dependence on external systems

The role of external systems, in particular bilateral and multilateral agencies which provide needed resources, has been analysed earlier in various contexts and is studied in detail in the following chapter. Here, we would simply mention the role played by external systems in *planning*. To what extent is comprehensive planning *furthered* by the presence of external agencies, and to what extent are these agencies responsible for short-term inaccuracies in the plan?

As stated previously, the presence of foreign advisers with their relatively rigorous requirements for funding tends to make the planning far more detailed and thus somewhat more accurate than it otherwise might have been. Precise estimates and specifications are required, and this may increase the realism of the plan. It may also indirectly help to build up a more elaborate and reliable data base for other programmes. To give an illustration, here is an excerpt from an interview with a Latin American expert:

> At the start the request was for 340 hours of psychology and pedagogy. But I went over with them the numbers of teachers, students and the hours for other courses for this year and the other years planned in the project. I succeeded in reducing the request to 220 hours, and now they find that even that was too much; they can't fill them up.

As experienced and neutral outsiders, these advisers can serve to reduce somewhat the gap between aspirations and possibilities, although this is not always the case. We have already seen that early outside intervention can mean problematic implementation and less successful replacement of foreign personnel and finance. Such projects may be quantitatively realistic but operationally impractical or inappropriate. Similarly, the outside agencies' emphasis on quantitative planning may act, as shown above, to mask weaknesses in the qualitative assessment of needs and probable outcomes.

There is also evidence that the participation of external advisers in planning increases the importance and care given to ongoing evaluation. In the survey responses, the creation of a special unit for ongoing (formative) and final (summative) evaluation is closely related ($C = .61$; $p < .001$) to large-scale projects (over $300,000 annually) financed from outside the country. There is a similarly strong and significant relationship between large-scale externally funded projects and the collection of systematic data for evaluation ($C = .38$; $p < .001$).

However, the influence of external assistance is less clearly helpful in assuring smooth implementation of the plan. When the performance of the external agency is unreliable, this increases the instability and unreliability of the procedural or organizational structure which services the project. To give an example, here is an excerpt from an Asian project evaluation report:

> There were delays in the arrivals of experts and equipment. This slowed up both the courses and the construction of new buildings, and it explains why phase II in the plan of operations was so different from phase I.

Mhina provides another example in his account of the very ambitious Kibaha Education Centre in Tanzania. The project, planned and funded for five years, took seven years and consequently cost more than expected. Mhina attributes the delays to four factors of which two were neither predictable nor avoidable since they depended on the performance of another system. The Nordic countries providing finance were responsible for shipping delays, delays in the arrival of equipment, and delays in decision making. However, Mhina goes on to show that, on the other hand, a great asset to successful implementation was the *continuity* on the part of the external administration: 'there were only two Nordic directors in seven years'. (36)

Social, cultural and psychological factors in relation to the accuracy and responsiveness of planning

Unlike technological changes (e.g. construction of machinery or manipulation of objects and artifacts), social reforms are difficult to carry out exactly as conceived. A plan for reform in education assumes that people and institutions will function in the most rational, efficient way during implementation. It assumes that, for all concerned, the innovation will appear more advantageous than the present arrangements. Institutions, however, function less in accordance with plans than with the dynamics between people concerned, dynamics of consensus, conflict, distribution of power, and the like. In the same way, most arrangements between individuals are not primarily *contractual*, but rather 'interpersonal', i.e. based on trust, consideration, dominance, etc.

For example, while the leader of an institution and his staff may all agree that there should be a new study plan allowing for more 'active' learning on the part of the students, they are likely not to implement it in a way that changes the authority relationships between them and their students. For an outside evaluator, pupils who wait to be called on, who appear to be interested primarily in the 'correct' responses or who do only prescribed tasks are probably not being 'active' in the sense intended by the objectives of the new study plan. What has transpired is that the institution has succeeded in transforming the plan through a process of internal compromise and bargaining until it has become acceptable to the task structure and distribution of authority within the institution and between its members. The basic dynamic at work here is called 'social reciprocity'. Each party in the institution is dependent on others in order to maintain its own position and to perform its roles, and as structural changes are made these dependency relationships are changed. This poses a threat to the existing status of each member. As a result, it will be difficult to train people for new roles as long as such new roles make incompatible demands on existing roles. This will hold until the new roles become dominant or some other accommodation is made. (37)

Similarly, the illiterate adolescent or adult learner may be eager to learn to read and will transmit this desire to the organizers of a literacy project, who then plan an instructional programme. But the learner may not be willing to be in the same class with people whom he dislikes or even with those he respects (for fear of appearing ignorant), and will drop out. This is probably the most 'rational' decision he could make in psychological terms, but it may appear irrational to project directors who see people expressing a strong desire to learn to read and then abandoning one of their only chances to do so.

Below is a brief explanation of some of the implications of these social, cultural and psychological factors:

- a 'plan' for change in education cannot be 'delivered' in precisely the same shape as it was planned. Unless the planner has full control over the behaviours of all the institutions and people involved in the innovation, he must expect that the setting will modify the plan in accordance with the dynamics within that setting;

- plans which are based on a careful study of the local setting(s) are therefore likely to be more accurate; and
- plans which are negotiated with the institutions and key persons in this setting are likely to be more reliable.

Example of participation and recruitment. In order to probe these hypotheses, we shall look at two typical problems encountered in the course of implementation when total control was not possible and neither careful study of local settings nor negotiations were carried out. First, in relation to the problem of *participation* or *recruitment*, we shall look at two examples from Lallez's study of the CER project in Upper Volta:

> The number of pupils doubled (from 8,100 to 17,351) between 1963/64 and 1965/66. It will be noted, however, that the target of 1,350 CERs set in the 1959 Plan for the fourth year of the exercise is far from being achieved, while there is cause for concern at the fact that the number of boys far exceeds the number of girls, who in fact are only 622 spread over 19 CERs.
>
> During the second period, expansion is much slower, for by 1972/73 there are still only 737 CERs including 84 for girls. The following year there are only 761, i.e. *20 per cent of the forecast* of the 1969/70 Ten-year plan for rural schooling. The evolution of enrolment figures is even more disturbing. Whereas they had doubled from 1963/64 to 1966/67, by 1972/73 they stood at only 24,164, a decrease from the previous year's 26,992. Of this total, girls represent only about 10 per cent (2,485), also a decrease from the 2,944 of the previous year. (38)

> These reasons were to become increasingly evident and strong as the CERs evolved rapidly in a way diametrically opposed to their initial conception. ... The CERs were originally intended for pupils between the ages of 12 and 14 years, but were soon attended by young people aged between 13 and 17 years, and more especially by children of 9 to 11 years of age. (39)

Next, a citation from the ICED analysis of the VIC project in Nigeria:

> Although the declared target population of the VICs is the self-employed artisan or the apprentice of a small-scale entrepreneur, this aim is far from being achieved. Less than one-third of the trainees were self-employed; more than half came from government departments or large firms. Of the 45 ex-trainees interviewed in Maiduguri, only three were self-employed before taking the VIC course, although 13 mentioned previous apprenticeship training in a small indigenous firm. (40)

Basically, what has happened in these two projects is that not enough people or not enough of the 'right' people were enrolled as had been planned for. Even more importantly, after the training had been designed it was given to the 'wrong' people (those for whom the training was *not* designed) who will learn less from it and will be less able to use it, while the 'right' people were going untrained.

There are any number of explanations – not attributable to planning alone – for the problems encountered in these two projects and in others. The origin is very likely to have been an error of judgement during the phase of need assessment and the design of appropriate and practical solutions. The need for schooling and for the particular *type* of schooling proposed was, in the project referred to above, real and urgent. The *form* of instruction was probably the most rational – in terms of cost-benefit analysis – given the numbers of teachers, potential students, facilities, materials and budget. However, for the target population, it is probable that neither the type nor the form of instruction was close enough to their needs and motivations to warrant the necessary sacrifice of time and energy, or to warrant their choosing this programme over alternative ways of getting instruction, social promotion or profit. On the other hand, in the case of the CER project, the problem may simply be that parents would not allow their daughters to attend. Those who decided not to attend, as well as those who chose to attend were, in both cases, making the most *rational* choices from their perspectives.

The problem here lies in the fact that the local setting was not carefully studied and the modalities of the project were insufficiently negotiated with local leaders or potential participants. A relevant passage from an evaluation report of a South Pacific curriculum development project highlights one aspect of this problem:

> Some expert time might have been saved if more information... could have been collected in advance. A great deal of knowledge about the traditions, the aspirations, the economic situation, etc., of each island group was needed to develop curricula which were relevant in different settings.

In many cases, the basic question of *scale* plays an important role: were the project smaller or divided into sub-projects, the target population would be more restricted and therefore more easily studied, understood and contacted, and local adaptations could be more easily designed and negotiated.

Example of individual learning and change. To begin with an illustration, we will look briefly at both target populations of the CER project: the teachers and the students.

> The rural teachers' approach to teaching was far from compensating for these shortcomings and unsuitability of the teaching materials. It was as inappropriate to the population concerned as it was to the objectives aimed at. But affecting the direct, main agents of rural education, this problem was to take on a much more serious form. First of all, by reason of his parentage, the teacher seldom showed the slightest inclination towards an agricultural vocation. Often he had made early attempts to escape from the village, but his slender intellectual means had not taken him as far as he had hoped, so that after trying his hand, of necessity, at various trades, he had resigned himself to becoming a rural teacher. Nor did the training received seem likely to lead to such a vocation or to compensate for its absence. The short period of training in an ORD, outside the Training Centre and bearing little relation to it, could not suffice to make much difference to the character of the instruction given in this Centre. This instruction made practically no call on specialists in rural education, and kept the training to a school tradition which left no room for real originality in the approach to teaching practical and agricultural work. (41)

> With the exception of phenomena of rejection of local resistance stemming, here and there, from cases of poisoning due to improper use, it may be observed that, in areas where there is a CER, the uses of substances for disinfecting seed and protecting crops against insects and rodents has developed considerably. It is safe to suppose the former CER pupils have played a part in spreading these practices, although it had to be admitted that they have not managed to gain admittance to the family holding by the ORD, nor do they use them in their own fields. (42)

Once again, to look at the problem schematically, people are not behaving as planned. In this case, they are either not able or not willing to implement the innovation in the form in which it was designed. Therefore, they transform the innovation into a practice which they have already explored and had success with – something familiar – and thereby reduce the margin of change actually accomplished by the project.

Here are the same inadequacies as in the former example: (a) the local setting was not sufficiently studied or taken into account during planning, and (b) the innovation was *administered* without having been sufficiently *negotiated* with the people for whom it was intended. There is, however, another related problem: the solution apparently did not provide for the kind of preparation, practice and support necessary for successful implementation. This is to say that the project did not adequately train people to use the innovation; did not give them an opportunity to explore the consequences of using the innovation until its strangeness wore off and they felt comfortable with it; or it did not give people adequate support (in the form of advice, materials or simply compassion during difficult moments) when they used the innovation in a new or more complex situation. We have seen earlier how these three preconditions are crucial to individual learning and change. Without them, there is invariably a reversion to earlier, more secure patterns of behaviour.

The errors appears to be those of 'administrative' planning – the tendency to assume that if someone is convinced of the utility of learning to do something new, and is shown briefly how to do it, that is enough for him to learn a new skill successfully and to practise it durably. For the planner, a document or speech explaining the merits of a programme, the organization of a short training programme and the provision of a number of accessory tools or materials after training are often judged sufficient in projects involving teacher education, curriculum development, vocational training, adult literacy, and rural education programmes in health, hygiene or agriculture. In fact, much empirical research shows that this is *not* sufficient for successful motivation, tryout or continuous implementation of a new skill.

The problem is increased when there are several new skills or attitudes to be learned rapidly, as is often the case in our sample of projects. On the one hand, there is the degree of complexity of the innovation with its corresponding required learning time. By 'complexity' we mean (a) the number of parts there are in the innovation; (b) the number of behaviours or skills to be learned or understood before adoption is possible, or (c) the number of procedures required for effective maintenance over time. The more difficult it is to understand and to use, the less rapidly an innovation will be adopted.

On the other hand, there is the clinical aspect involved in learning new skills, where the possibility of failure can mean a lowered sense of one's competence and worth. This is the reason why self confidence is so closely associated with innovative behaviour and lack of self confidence with resistance to change. It is important to understand that innovations are not adopted by people on the basis of the intrinsic value of the innovation, but rather on the basis of the adopters' perception of the changes they personally will be required to make. Those designing, administering and advising the projects do not generally have to make very many changes *themselves*. *Their* task remains the same. It is the *others* who will have to modify their behaviours and, very often, to modify them rapidly, in fairly significant ways, and with little previous or even gradual preparation. These are typically the kinds of rapid and massive changes which planners or administrators or advisers would never plan, administer or advise for *themselves*. This is yet another example, in large-scale or centralized projects, showing the dangers in cases where the innovator is separated from his public.

In brief, change involves stress, even when the change is desired. (43) There is a tendency to avoid undue stress in as many aspects of everyday life as possible, or to reduce it to a tolerable level if it cannot be entirely avoided. Plans which assume that people will accept to function in situations of high novelty and complexity without long periods of preparation, safe practice and support are erroneous. They underestimate the psychological importance of order, routine and predictability, although it is precisely these three qualities which careful planning is meant to achieve in facilitating the smooth and durable adoption of an innovation.

Notes and references

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CHAPTER SIX

Resource acquisition and utilization: inputs to the innovation project: what and how

The ultimate success of an innovation project depends to a very large degree on what goes into it in the first place: ideas, technology, people and money. This chapter attempts to give an overview of major types of input and the considerations which must be weighed in their selection and incorporation. As noted in chapter II there are two broad categories of inputs, those which are proximate (inside) and those which are remote (outside). Our survey of teacher training projects asked several questions about both types, and we will report on these findings here, making comparisons wherever possible between the two. We will try to move toward some conception of 'ideal' balance in resource acquisition strategy, recognizing that all resources are not equally accessible and not equally important to a particular project or to a particular type of project.

It must first be recognized that there is no such thing as an innovation which is entirely independent of any input or any acquired resources. All systems and all projects, innovative or not, must acquire several varieties of resources, almost always from both the proximate and remote environments. Projects which claim to be totally innovative or totally independent are really saying that they are relying almost exclusively on the *proximate* environment, i.e. locally or nationally determined goals, locally or nationally raised financing, locally or nationally recruited staff, and locally or nationally acquired technical knowledge, ideas and structures. Once this inevitability of inputs is accepted, it is possible to recognize two poles of thought regarding the optimum balance between the proximate and the remote. The proximate pole says, 'We should do everything for ourselves with what we have here; import nothing; use nobody else's money; nobody else's ideas or technology; nobody else's ideology, structure, or process'. The remote pole says, 'We know very little; we must copy the developed countries and catch up with them; we must accept their ideologies (left or right); we must model our economic and social structures after theirs; we must use the same very advanced technologies that they now have, and, if we do, we can leap-frog over all the complicated and time-consuming intermediate steps they took to get to them'. Obviously, neither of these poles represents a completely rational approach to innovation, although the former is currently in fashion in many parts of the world and the latter is mostly out of fashion everywhere. However, these are valid expressions of *postures* toward resource utilization and the polarity tends to flavour much of the literature on this subject.

This chapter introduces a number of considerations which cut obliquely across this polarity in different and sometimes interesting directions. For example, the *trust* dimension has probably to be considered as a separate kind of polarity. Some societies and some innovators are more open than others to inputs from various sources. They are less concerned about *defending* the system as it is than they are about providing it with the right kind of nutrients to let it thrive and grow, and they are more willing to take the risk that the input might have some negative as well as positive consequences. It can be shown that this polarity cuts across the previous one: first of all, both the remote and the proximate poles distrust the other type of input and, secondly, some people and systems will have a tendency to trust and be open to more inputs from both the proximate and the remote environment.

Whereas some systems may be more innately trusting than others, there are several other considerations which cause some systems to be more open to all inputs than others. Each of these can be identified as a dimension or a polarity which cuts across the others. Five of the most important of these dimensions should be mentioned briefly here.

A most important dimension is the *safety and stability of the environment*. Some systems exist in environments (proximate and/or remote) which are either hostile or chaotic. Thus any potential input is also a potential threat. Under such circumstances no system can afford to be very trusting.

A second 'reality' factor is the relative *richness of the environment* in comparison to the resources already contained within the innovating system itself. For example, a relatively poor country with very limited capacity to develop its own technical resources and manpower, such as Papua New Guinea, may be tempted to reach out for resources from a materially and technically rich neighbour like Australia, whereas the Australians are less likely to look in the other direction for inputs of the same type.

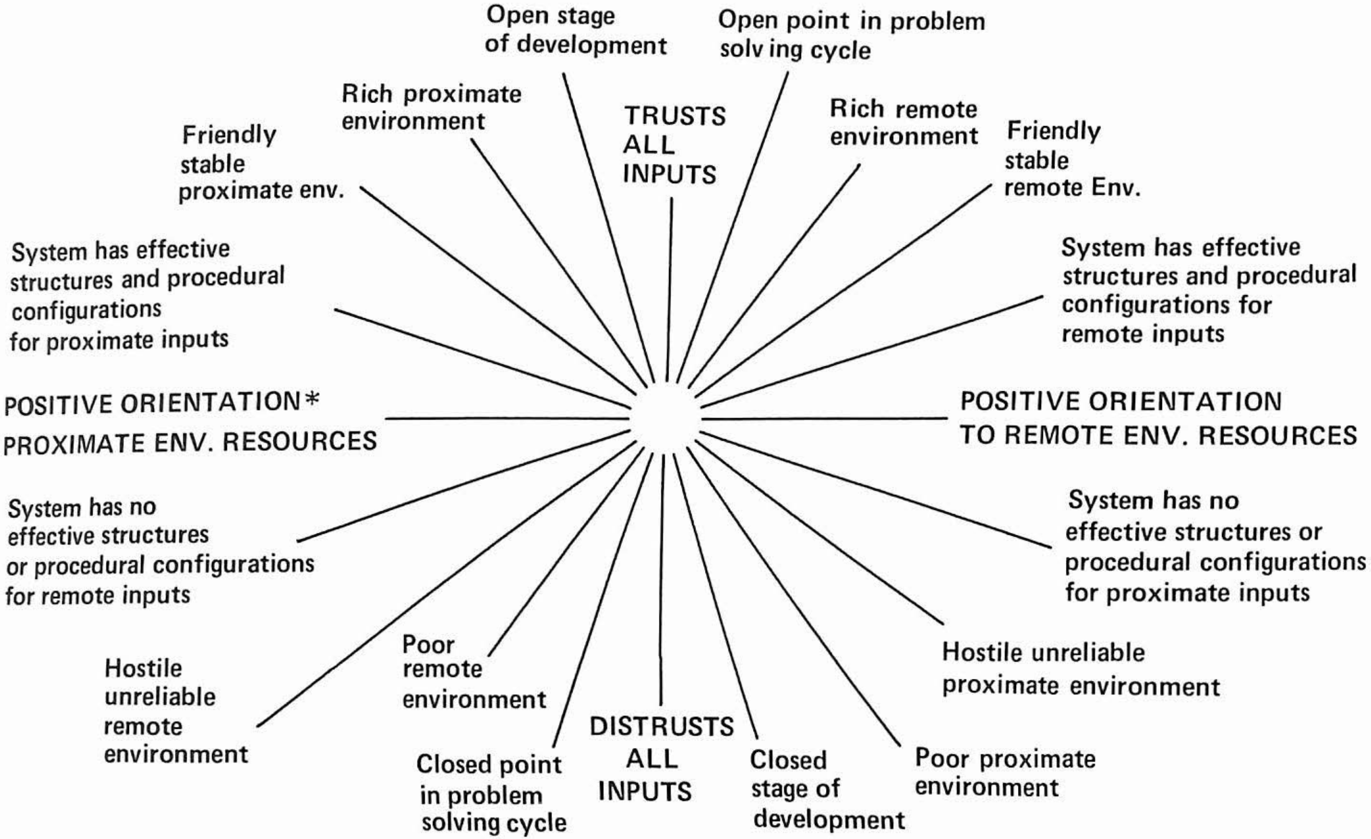
Another important factor is the degree to which the system has *internal structures and processes* (procedural configurations) which allow and encourage the acquisition of knowledge from the environment (proximate and/or remote). Some systems will have specialists who spend all their time hunting for new inputs; others will have no such task or role even identified. Effective input will not happen unless time, manpower, and other existing internal resources are expended routinely in the acquisition process.

There are two other dimensions which should be mentioned which relate to the *timing* of inputs. In other words, openness will vary depending upon the particular condition of the system at the time of reference. First, considering the short term, as noted in chapter II, all systems are continuously engaged in some sort of problem-solving activity which is cyclical in nature, the same kinds of steps being repeated on each attempt at solution or for each new problem. (The sequence of these steps is what we referred to as the 'procedural configuration'.) However, at some points in the cycle a system is likely to be open to fresh inputs of certain kinds (e.g. at the stage of need determination, or solution search) while at other times it is likely to be preoccupied with its internal functioning (e.g. at the stage of implementation or consolidation).

A second, longer-term timing consideration is the stage of development of the system as a whole. We have speculated that systems go through cycles of growth and experience critical moments of dysjuncture where redefinitions of the system, its goals, and its most important procedural configurations take place. It is likely that systems are more open to fresh input either from the proximate or the remote environments or from both at these critical moments.

From this brief discussion it can be seen that openness is far from being a unidimensional characteristic of systems. Figure 29 summarizes these points by drawing each dimension from pole to pole and arranging them between the two dimensions of 'proximate-remote' and 'trust-distrust'. All of the poles on the left side of the figure represent the various reasons why a particular system at a particular time might be disposed toward proximate inputs exclusively. All the poles to the right represent the reasons why a system might be positively disposed toward remote inputs. All the poles in the upper part of the diagram represent reasons why a system might be trusting of inputs and open to them. Those in the lower half represent the reasons why a system might be closed to new inputs. It is certain that even this

FIGURE 29. Dimensions of openness to resource inputs


Open stage of development
Open point in problem solv ing cycle
Rich proximate environment
TRUSTS ALL INPUTS
Rich remote environment
Friendly stable proximate env.
Friendly stable remote Env.
System has effective structures and procedural configurations for proximate inputs
System has effective structures and procedural configurations for remote inputs
POSITIVE ORIENTATION* PROXIMATE ENV. RESOURCES
POSITIVE ORIENTATION TO REMOTE ENV. RESOURCES
System has no effective structures or procedural configurations for remote inputs
System has no effective structures or procedural configurations for proximate inputs
Hostile unreliable remote environment
Poor remote environment
Hostile unreliable proximate environment
DISTRUSTS ALL INPUTS
Closed point in problem solving cycle
Closed stage of development
Poor proximate environment

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* In the sociological research literature on the diffusion of innovations, (1) this polarity is typically referred to as 'localite *vs.* cosmopolite'.

complex diagram does not represent all the factors involved, but it may serve as a kind of introduction to this important topic.

The chapter will be divided into nine sections as follows. The first section will discuss the over-all importance of resource acquisition and its relationship to other aspects of the innovation process. The next section will consider the question of financial resources, the importance of the size of the project and the balance of inside (proximate) and outside (remote) financing. There follows an overview of the various types of technical knowledge that could be used in an innovative project. The ensuing three sections provide a deeper analysis of the main categories of outside knowledge and inside knowledge, leading up to a synthesis based on our survey data of what might be the most sophisticated pattern of resource acquisition and use. Another section reintegrates the analysis of I, A, and C factors introduced in chapter III and proposes the addition of the 'R' factor for resources. The last section proposes an ideal model of the *process* by which knowledge is acquired and utilized, tying the elements together, returning to the question of openness and stressing the necessity of dialogue between the system and other systems to achieve the optimal level of utilization of all relevant resources.

THE IMPORTANCE OF RESOURCE ACQUISITION AND UTILIZATION

In reporting on the Jombang Youth Project in Indonesia, Woodhouse and Lubis make the following comment:

> For the new multifaceted educational approach to have a significant impact and to survive, *a large-scale mobilization had to be undertaken of all resources in the district that could be put to use in the educational program*. Such resources included: (a) the personnel of the government service agencies in the district; (b) staff of the formal education system; (c) people with leadership ability, specialized knowledge and skills, and special experience in the community; (d) physical facilities of the formal educational institutions, private and public industrial establishments and other economic enterprises, and other public and social institutions; and finally, (e) the enthusiasm, initiatives, and willingness to contribute of the district people for a better future of the younger generation. (2)

Obviously, what these authors are talking about are *proximate* resources, especially significant since this is a locally initiated project, but what we would like to note is the very wide *range* of resources that *must* be brought together to make the project work. It is an especially important lesson for innovators who sometimes like to think that their own creative ideas and the resources already at hand are enough to bring success and that all these other things are an interference.

In our survey, we found that Unesco Chief Technical Advisers and their national counterparts were equally aware of the importance of resources of various kinds, both from inside and from outside the host country. For example, in response to the question, 'Was acquiring technical knowledge considered to be an important aspect of the project?' 66 per cent checked 'extremely important', 33 per cent 'somewhat important', and only 4 per cent 'not at all important'. This question, of course, refers only to 'technical knowledge' with the added implication, perhaps, that such knowledge can only be acquired from remote sources. However, it is also clear from our respondents that 'innovation' must really be a fusion of new and old, outside and inside. This is well illustrated by their responses to another item regarding the degree to which they perceived these rather large-scale teacher training projects as 'innovatory':

In its present form, would you described this project as innovatory?

11 per cent: Entirely new and original, not based on outside technical knowledge.
63 per cent: Represents a mixture of new and old ideas from inside and outside.
11 per cent: Represents a mixture of new and old ideas but almost entirely generated within the country.
11 per cent: Is primarily an adaptation of concepts and procedures already half understood and implemented in at least one other country.
4 per cent: The project is not primarily innovatory but rather represents a continuation, expansion or duplication of programmes already well established within the country.

These findings should be interpreted with caution, however, for various reasons, both methodological and substantive. First of all, the question is worded in such a way that the second item may appear to be the 'obvious' choice; furthermore, some of these response categories have two parts, old-new and inside-outside. Thus it is difficult to know which part is being responded to unless it is assumed that the two necessarily go together. Finally, we need to recall once again that these are not a representative sample of all types of innovatory projects in education. In fact, we would suspect that the sample is strongly biased in favour of those projects where outside resources did play a major role. Unfortunately, there are few examples in the literature of projects representing the most localite (proximate resource) orientation. This is not to say that such projects do not exist. Indeed, they may be by far the most common type. On the other hand, they are also the type for which there is the least motivation for documentation.

One additional item from our questionnaire may give some notion of the degree of importance attributed to resource acquisition in general. Respondents were asked to rate the degree of emphasis given in their projects to each of thirty strategy options. One of these items read as follows: 'Maximum use of all resources, national, local, and outside'. A total of 86 per cent rated at least 'moderate emphasis', 64 per cent either 'high' or 'extreme' emphasis.

Such data are hardly needed to prove the importance of inputs, but they do serve to underline this fact. No innovation project can be viewed sensibly as a thing in itself without looking at the resources of all kinds that went into it. What must be stressed, however, is the expression 'of all kinds', because the difference between success and failure does not depend merely on the presence or abundance of one kind of resource only; it does not depend on the amount of financial investment, the technical expertise of the consultants, or even the validity and merit of the ideas behind the innovation. Rather it depends on a complex configuration of inputs in which these and other types of resources to be discussed in this chapter each play a role.

Finally, it must be noted that resource inputs are potentially important for good *or for evil*. An over-abundance of a certain kind of resource or the introduction of an inappropriate technology may actually do considerable harm to the project, to the project's clients and even to the host culture, even to the point of disabling, destroying, or distorting vital aspects of the culture; in other words, sometimes resources from outside can act as an invading virus, damaging and scarring the social organism the way a real virus damages and destroys the body.

FINANCIAL RESOURCES

One of the most apparent facts about a project is how much it costs in financial terms. Unfortunately, this 'vision' is more likely to be illusion than fact, for a variety of reasons which will be identified. However, it would be well first to consider briefly what is meant by 'financial resources'. Money is basically a token system which allows *all* things to be evaluated on the same scale, usually for the purpose of making exchange or trading of goods both equitable and convenient. In theory, it is a grand idea to have a single measure for all things; such a measure potentially allows us to compare all actions, ideas, innovations, products, people, organizations, projects and even nation states on a comparative basis; hence it appears to make a truly comprehensive and predictive science of society possible; and indeed, this may be the reason why so many decision makers in all countries turn so often to economists for policy guidance. The trouble is that there is no such measure in reality, and even if such a measure is conceivable, it certainly is not likely to be 'money' as it is commonly known.

However, as a rough basis for *exchange* of *some* specific kinds of resources, money remains a useful and indispensable symbol. The principal caveat is not to over-rate its meaning, especially not to use it as a measure of true value. As an evaluative measure, money is also a convenient way to aggregate and summarize the cost of innumerable minor products, services, and facilities which projects require, the separate accounting of which would make any analysis burdensome and unreadable.

This section on financial resources is divided into three segments as follows. The first segment lists and discusses the many reasons why financial data are problematic as a measure of resources. The second segment provides some data on the relative magnitude of educational innovation projects and the correspondence between magnitude and merit. The third segment addresses the issue of inside versus outside financing.

Problems with financial measures as general measures of resources

There has been much discussion in recent years of the possibility and even the necessity of looking at innovation projects in 'hard' economic terms, to make a more thorough accounting of true costs (inputs, resources) in comparison to benefits (outputs, results). Yet, from our review of the literature, especially as it pertains to the developing world, such an emphasis would seem to be premature and misleading at the very least. Here are a number of reasons why financial facts and estimates are problematic when it comes to educational innovation projects.

1. Some of the most important inputs are not quantifiable and are rarely included in cost estimates. Often they are naïvely dismissed as either 'givens' or 'free'. Most notable in this category are ideas and information of all kinds. Only when such items are embodied in real people, e.g. as consultant time, do they become accountable. There may therefore be a tendency to discount the value of information which comes from books and other print forms which are more or less 'free' or which come in the form of freely contributed advice on what to do or how to do it, which may come from anywhere.
2. Volunteered or shared services or manpower are rarely accounted as 'costs' even though these may constitute the principal resources especially for non-formal education projects.
3. The same applies to the utilization of space, facilities or equipment that would otherwise remain idle for part or all of the time.
4. The costs of students, representing in a way the most vital input to any educational enterprise, are almost never accounted in economic terms. There are at least three distinct types of 'student' cost which too rarely receive an accounting. First, there is the cost of maintaining them, providing food, clothing, lodging, etc. for the time they are being educated. Such costs are often borne by families, by students themselves, or by the state. A second student cost is the 'opportunity' cost which is lost to the society and to themselves by keeping them out of the labour force. A third cost, almost never accounted, is the actual labour of students as learners, studying,

writing, producing within the educational frameworks provided. It is true that many educators are beginning to come around to the idea that such labour may eventually have to be paid for, but for now it depends heavily on the individual motivation of the student to work long, hard hours now for some remote future benefit which can neither be perceived clearly nor guaranteed. Hence, students represent a vast set of resources which are rated as either free or unaccountable in any educational undertaking.

5. One of the most important resources of a project may well be the goodwill, enthusiasm and support it receives from political leaders, individual citizens or the community or society as a whole. Most projects which are reported as 'successful' innovations in the literature have this unaccountable resource in abundance. But there is often a failure to recognize that this resource can be expendable and it can be fleeting. When goodwill resources are depleted, other costs escalate insufferably: volunteered services, time and facilities suddenly have to be paid for in real money, the long hours of contributed time by enthusiastic staff members become strictly accounted eight-hour days and 40-hour weeks, and all 'services rendered' are billed at the highest going rate.

6. A question related to financing which is confusing for the economic evaluation of educational projects, especially in developing countries, is the basic 'opportunity cost' question: 'What else would be done with these people, these facilities, these materials, if this project did not exist?' As often as not the answer may be 'nothing'.

7. Another economic puzzle stems from the fact that 'costs' for a project are often likely to be ,benefits' in one way or another to the larger system in which it is embedded, either by providing employment or as a market for various goods and services. If the goods would otherwise remain unsold and if the manpower would otherwise remain idle, the 'costs' would be at least as great.

8. Further mitigating the value of cost-analysis in developing countries is the fact that cost data are harder to come by in such countries as a by-product of their very lack of development. It may be that stricter financial accountability is an important attribute of 'development', but it does not necessarily follow that this attribute should precede others.

9. Finally, it also appears that cost accounting may be most difficult for the most innovative types of educational projects such as those in the area of non-formal education, new school structures, individualized or open learning systems, etc. This is partly true because they represent a convergence of many of the eight problematic measurement issues raised above.

Having raised them, however, it is not possible to proceed to discuss financial aspects of projects as if they can be viewed in isolation. These problems cannot be brushed aside as mere caveats or as factors which will have to be entered into the equation at a later date. From the outset they should call into question economic analysis as almost hopelessly limiting and distorting as a means of understanding educational innovation. More satisfactory means must be found for aggregating inputs and outputs. Nevertheless, we feel compelled to provide some discussion of strictly economic and financial variables in order to reflect the literature fairly and perhaps to provide some insights within the limitations already discussed.

Magnitude of financial resources and its effects

The magnitude of financial resources invested in a project probably represents a crude but valid measure of the magnitude of a project over-all. This is perhaps the safest generalization which can be offered, but it does not convey very much. It also has limitations in that some (not many) projects can be large in many respects, e.g. numbers trained, and still be small in financial investment, while others can be large in financial investment and small in some other important respects, e.g. the region served, numbers affected, etc. All this is only to say that the measure *is* crude.

The range of magnitude of projects with which we would like to be concerned is very large, stretching from the classroom to the nation or even the multi-national. We believe that many of the principles and strategies of innovation discussed in this book apply at all levels of magnitude. As a practical matter, however, our range is rather more restricted to the upper end of the continuum. In our special sample of Unesco-UNDP teacher training projects, the range of magnitude was definable in three distinct ways: (a) the national contribution, (b) the UNDP contribution, and (c) the numbers to be trained. These three ranges are displayed side-by-side in Table 6.1.

TABLE 6.1. Three measures of project magnitude

US$ Thousands	UNDP contribution %	National contribution %	Numbers trained	
			%	Total
Under 500	27	17	22	Under 100
550 to 1,000	30	89	24	100 to 499
1,000 to 2,000	23	26	11	500 to 999
2,000 to 4,000	12	17	22	1,000 to 1,999
4,000 to 6,000	5	7	17	2,000 to 10,000
over 6,000	2	24	0	10,000 to 50,000
			4	Over 50,000

It can be seen from this table that the median level of UNDP funding was just under $1,000,000 whereas the median national contribution was just under $2,000,000, or about double. Furthermore, there are many more nationally funded projects in the largest category. Regarding the numbers trained, the median is approximately 700. By extrapolation it is thus possible to arrive at a mythical 'median project' which has total resources of $3,000,000 with an average cost per trainee of somewhat over $4,000. We hasten to emphasize, however, that this *is* a mythical figure. In fact the three measures are rather poorly correlated with each other. National and UNDP contributions are correlated only .27; hence, the one measure is only weakly predictive of the other. National contribution is even more weakly related to number of trainees (.22) and there is virtually no relationship between UNDP contribution and numbers trained (.12).

The question of most relevance to this discussion is whether larger amounts of funding lead to more successful or less successful projects. Unfortunately, there could be no simple answer to such a question, and, in any case, our data do not refer directly to this point. However, some ideas on the apparent effects of the magnitude of funding may be gained by looking at the various items in our survey which are correlated with the amount of national contribution. In the statistical analyses which were made, it was found that this one item (national contribution) was one of the three items out of nearly 250 which were most highly related to other items. In other words, the magnitude of the national financial contribution seems to be connected in important ways to many other process factors, some of which may cause the financial contribution to be higher and others of which may be caused by the amount of financial contribution. It is impossible, except by surmise and logic, to separate causes from effects. Therefore, the meaning of Table 6.2 will have to remain somewhat ambiguous.

In spite of the limitations, this table is quite revealing. First of all, it is clear that the amount of publicity surrounding a project is related to the amount of funding,

TABLE 6.2. Variables related to the size of the national contribution and UNDP contribution (listed in order of magnitude of the relationship; product-moment correlations)

	National	UNDP
Extensive use of political speeches, newspaper, radio	r = .45	r = -.01
Acquiring technical knowledge from outside the country	.44	.21
Following a strategy of very wide-open participation and resource utilization	.38	-.01
Following a strategy of informal channels, opinion leaders together with media	.37	.05
Use of all types of media	.35	-.09
Project objectives viewed as realistic by respondent	.32	-.03
Project objectives were defined with considerable outside help	-.29	.03
Project has been able to move toward replacement of outside financial assistance with inside	.29	.09
Project has been able to replace outside technical assistance with inside	.25	.16

and this is probably both cause *and* effect; the very size of the project leads to more publicity, and the amount of publicity and national recognition, especially by political leaders, leads to higher levels of financing.

The second correlation is perhaps more surprising. Higher levels of national funding result in higher efforts to acquire outside technical knowledge, apparently more so than the level of outside funding. This pattern also seems to hold for all kinds of inputs, inside and out. It also appears that the higher the level of national financial support, the more likely the respondent is to feel that the objectives of the project can be accomplished (cf. the discussion of this point in chapter V). It also appears that outsiders are less likely to be deeply involved in establishing objectives if the national contribution is large. Finally, the last two items indicate the extent to which projects have been able to nationalize their efforts. Larger projects seem to be slightly more successful in moving in this direction.

None of these findings is very conclusive, but an over-all pattern is suggested that strongly favours the project which has the higher level of national financial support. Such projects attract more national attention, do a better job of bringing in all sorts of resources, and seem to have a better chance of being successful and being maintained in the long run.

Outside vs *inside financing*

A quick examination of Table 6.2 also suggests the rather feeble impact of UNDP support on the dimensions considered here. There were only two areas where there were noteworthy relationships not overshadowed by the national contribution factor. One of these was the level of effort invested in evaluation of the project (r = .32). This evaluation effort index included such items as 'use of external evaluator', 'experimental and control groups', 'clear evaluation criteria', 'systematic data collection', 'direct observation of behaviour in the field', and 'quantitative written reports'. It is not clear, however, that evaluation *per se*, adds to the value of the project. Indeed, such a finding has a somewhat disquieting implication for the literature on innovation in general since it suggests that the more rigorously evaluated projects may be a biased sample.

The other noteworthy relationship is a slight (-.22) *negative* relationship between UNDP support and the vigorous search for knowledge and technical resources *within* the country; it suggests the possibility that some projects may get a bit lazy about looking around within their own (proximate) environment when such funding *temporarily* makes more remote sources more accessible.

Some of our most interesting evidence regarding the effects of financial resources comes from a series of items in the questionnaire related to financial barriers to innovation. Table 6.3 presents the distribution of responses to some of these items.

The table shows that 42 per cent of the respondents rated inadequate outside funds as a serious problem and 50 per cent rated inadequate inside funds as 'serious'. Further statistics analysis showed that ratings of inside and outside inadequacy were in fact rather highly correlated (r = .54) and that all the above items formed an intercorrelated cluster which we could call 'economic troubles'. Some of these correlations are shown in the last two columns of Table 6.3. What is most surprising is that there is no relationship between this cluster of variables and either of our measures of actual level of project funding upon which Tables 6.1 and 6.2 were based, (r = .01 and .02 for UNDP and national funding levels respectively correlated with all the above items, taken as a group; more fine-grained analyses of these data were not possible. Very surprisingly, this 'economic woes' cluster correlated *negatively* (-.19) with the number of trainees in the project; in other words, the fewer the trainees the more troubles! Other correlates of this cluster were 'planning emphasis' (r = -.27) (the more economic troubles, the less emphasis on planning), a greater effort to acquire outside resources (r = .20) (perhaps reflecting the grandeur' phenomenon described in chapter III), and more attention concentrated on rigorous evaluation (r = .21). Predictably, projects in the 'woes' cluster also had more trouble disengaging from outside financing (r = -.20). The 'economic woes' syndrome is most highly correlated with other 'barrier' dimensions suggesting the burden of a colonial past and the minimal development of indigenous infrastructures (low skill levels, poor interconnexions among regions, uncertain and untested political leadership and political structure, etc.).

Beyond our findings with regard to these teacher training projects, there is considerable evidence from other sources that outside financial assistance is a vital factor in many types of educational innovation. Schramm (3), for example, speaks of the necessity of initial outside support for all the instructional television projects he studied. In summarizing from the experience of eleven non-formal education projects in different parts of the developing world, Coombs et al. note, 'what stands out most strikingly... is the important role played by external assistance in almost all of the cases, especially with respect to capital items and initial development costs'. (4) Actually, in six of the eleven cases, foreign assistance also contributed in substantial measure to operating costs as well.

But even if it is conceded that foreign financial assistance is needed by many educational projects, there remain many dilemmas regarding the ways in which such aid should be administered. It may be, for example, as Coombs et al. claim in the case of nonformal education, that certain *types* of innovation deserve special attention from international sources. Nonformal education tends to cut across traditional categories of government, involving two or more ministries as well as various parts of the private sector. Hence, there is no ready-made solid constituency and no infrastructure – hence the need for sustained support from outside until these structures

TABLE 6.3. Seriousness of economic barriers to innovation

	Extremely serious	Very serious/ serious	Somewhat serious	Observed but not serious	Not observed	Correlates with: inadequate financing	
	%	%	%	%	%	outside	inside
Inadequacy of level of financial aid from outside the country	10	7	25	27	31	–	.54
Inadequacy of level of financial support contributed by country	12	15	23	18	32	.54	–
Inflation threw original cost estimates completely off	10	16	25	22	27	.33	.62
Costs were underestimated even discounting the inflation	4	12	21	23	40	.26	.54
There were significant delays in the delivery of funds	4	7	13	16	59	.23	.46
The economic condition of the country as a whole	13	6	29	26	27	.61	.59
National economic priorities were in areas other than education	4	7	11	27	51	.45	.55

come into place and become accepted. Educational innovations which rely on relatively advanced technology may also require an initial push from outside, particularly to cover capital costs.

Another rationale for outside assistance is the 'initiating' strategy, the idea that innovations can be sustained with internal resources if they are only initiated with outside funds – presumably initiated to the point where all can see their benefits. Unfortunately, this strategy in its most naïve form almost always leads to nothing. One essential ingredient has to be a national capacity and commitment to carry on after the initial period. In case after case we find no such capacity. To quote from Schramm:

> None of these projects could have gone forward successfully without substantial support – financial, logistic, and technical – from outside. This raises the question of whether such 'forced feeding' is the best way to encourage national educational reform, or whether a simpler, less expensive method, supportable largely by local resources, might be more lasting even if somewhat slower. For example, one reason the Niger project stalled after reaching 20 classrooms was the feeling of the host government that its budget would not support a broad expansion. Similarly, the ITV station that Unesco helped build in Senegal went dark when the Unesco project ended. This seems wasteful of resources. On the other hand, both El Salvador and the Ivory Coast will probably be able to absorb the cost and technical demands of their national projects, although outside help was required to get them started; and American Samoa has accomplished the rather remarkable feat of Samoanizing its educational system in only eight years. (5)

Another related approach is the 'pilot project' strategy. Here the idea is that a model project can be created on a small scale using the best planning, technical assistance and substantial infusions of foreign capital. When this 'pilot' is shown to be successful, it will either be taken up automatically both by other areas within the country because of its apparent success or the government will realize that a national policy should be established to this end. Coombs et al. again provide an appropriate observation:

> ... few such pilot projects seem to work this way. Many decline or disappear altogether when foreign assistance is phased out, often because they were ill conceived and not subjected to adequate feasibility tests before being launched. All over the developing world there are graveyards of abortive pilot projects long since forgotten by those [outsiders] who first inspired them. (6)

There are at least two important implications. One is that unusual enrichment of a project from external sources renders its 'pilot' status meaningless since others in a poor country cannot hope to imitate nor can it even be maintained at the original site. A second implication is that external support may be needed for most projects beyond the initial period to sustain implementation at the original site and diffusion to other sites. Indeed, aid for diffusion may make more sense than assistance to the original innovation in some cases. There are some instances where assistance has been provided for just such a 'diffusion' purpose, for example, the mobile training schools in Thailand as reported by Ahmed:

> The first Mobile Trade Training School (known as Mobile Trade Training Unit, or MTTU, until July 1970) was opened in Changwat Chumphon in Southern Thailand in 1960 by the Vocational Promotion Division in the Vocational Education Department of the Ministry of Education, giving effect to a Thai government decision to extend skill training to out-of-school youth with a least four years of education and no other opportunity to continue further education. The second school was opened in 1964 in the Northeast province of Sakon Nakhon.
>
> The program was rapidly expanded in 1966 when the Thai government sought and received assistance from the US Agency for International Development (AID) in the form of equipment, technical advice, and foreign training of program staff. The purpose of AID assistance was to set up 52 more schools by 1972. Expansion has proceeded according to the original plan – five schools were established in 1967, eleven in 1968, and nine each year since 1969, making a total of 54 MTTS in 1972. (7)

The poorest countries raise a double dilemma. On the one hand, a large amount of foreign assistance provided on a temporary basis may grossly distort local modes of coping, creating images and expectations which are far out of reach. On the other hand, such countries also have the greatest needs for support of both the initiating and sustaining variety. A comment from Grabe's case of an attempt to provide a rural alternative to primary schools is illustrative:

> Assistance was sought for the program from the European Economic Community-sponsored European Development Fund (FED), which agreed, in 1961, to finance 255 centers to be established for 11,250 boys. (The first centers built with funds from the FED, however, were not completed until 1966.) The FED also agreed to equip the central administrative services and five regional inspectorates. Further contribution to the implementation of the scheme were later received from FED for establishing teacher training institutions. Smaller contributions were received from Unicef - mainly tools and equipment; from the Food and Agriculture Organization (FAO) – seeds, fertilizers and gardening tools; from French bilateral aid – books and documents mainly for language teaching, and resources for printing basic agricultural education manuals used in the schools; and from bilateral and private American sources – various teaching aids and some food to help feed students during the months before the harvest. (8)

In other words, there was an impressive diversity of funding for this and that particular aspect of the project. However, further reading in the case reveals that there were subminimal rewards for the teachers at the village level and this became a major source for problems in the project; in effect, all the foreign assistance was of a show-case variety and was totally inadequate in serving the real longer term needs of this project.

From a financial point of view, the best projects may be those which eventually generate their own financial support. For example, Colombia's multi-media rural education programme has over the years built up some associated enterprises which provide income:

> ACPO's educational materials are printed by Editorial Andes, which ACPO owns. One of the five largest printing firms in Colombia, Editorial Andes, employs approximately 130 persons. Commercial work constitutes about 75 per cent of the Editorial Andes plant's traffic, and the profit from such work, which is undisclosed, goes into the general ACPO budget. (9)

Certain types of educational innovation lend themselves to this type of self-sustenance, notably nonformal projects which combine educational elements with such income-earning activities as agriculture, industry, crafts and commerce. There are many examples of such projects, including the barrio high schools reported by Orata and several of the cases reported by Ahmed and Coombs. However, it is questionable whether such an approach can be taken toward education as a whole; most educational enterprises, especially those serving the young, can never be significant generators of revenue.

Finally, it should be noted that the same dilemmas which arise in comparing national *vs* extranational financing also arise in comparing national *vs* regional or local financing. Orata, for example (10) rejects the notion that the barrio high schools should be nationalized and financed out of the national budget since he feels that students would soon lose the 'work-earn' experience which he views as a vital part of the programme. Furthermore, under such a scheme the sense of local ownership and pride in local accomplishment might be lost. Yet there are limits to local resources, as may be seen from the Indonesian case:

> The local origin and the dynamic leadership and support of the Bupati have lent the program a special strength. But at the same time it is deprived of the strength and resources of programs that have a national base in terms of organizational and administrative support and resource provisions. The program would have a firmer foundation and assurance of continuity if its local roots could be nurtured by a national commitment and thrust toward rural development and by decentralized development. (11)

If, then, there is a national responsibility to assume many of the sustaining costs of education, should there also be an international responsibility in the long run to assume some kinds of sustaining costs also?

TECHNICAL KNOWLEDGE RESOURCES: AN OVERVIEW

The term 'resources' covers a very wide range of things, including money, people, ideas, products, space, facilities, power, and even energy. When the focus is narrowed to what might be called 'technical' knowledge, there still remains quite an array, which is communicated in a great variety of forms from a great variety of sources, e.g. people, printed matter, 'experiences', training, advice, consultation, plans, procedures and products. Therefore, some confusion might be avoided by first attempting a classification. First, there are some generic knowledge *types*; secondly, all types of knowledge must emanate from some *source*; to be transmitted from the source, the knowledge must be cast in a certain *form or medium*; finally, as it reaches its destination, it must be received and absorbed according to any one of a number of possible uses, according to the receiver's need and circumstance.

Knowledge types

Considering what 'knowledge' means in a fundamental way leads to a rather small number of categories which make sense: we suggest that they can be limited to 'facts', 'ideas', 'methods', and 'frameworks'.

1. *Facts* are the smallest pieces of knowledge which are known to be true according to some criterion. 'Scientific facts' are known to be true by observation and measurement in accordance with the rules of science. There are precious few facts available as resources for innovation in developing countries and the existing facts in most cases are so unreliable that they sometimes might better be ignored. More will be said about this problem in chapter X with reference to project evaluation and the credibility of so-called 'quantitative' evaluations.

2. *Ideas* are the basic stuff out of which innovation projects are developed; some ideas may simply be perceptions of the existing state of affairs in the country or in the education system; others may be ideas about types of innovations that might work or produce certain kinds of benefits if they were to be applied properly. Some ideas are presumably more valid than others because (a) (most rarely) they are based on facts, (b) they emanate from people termed 'experts' on the subject, (c) they emanate from people who have long or intensive experience with the subject, or (d) they emanate from people who have power. Most prized in the innovation business are ideas which are supposedly creative or original as well as promising and relevant; in fact, however, almost all ideas come from somewhere else and represent the diffusion, transformation, adaptation, or integration of ideas and sometimes traits already available and in common currency in various parts of the world.

3. *Methods* are probably the most under-rated knowledge type because they are often not included as a category of real knowledge, being relegated to an inferior and ancillary status to facts. Often, however, the methods by which facts are collected and ideas implemented are more important, more relevant, and more readily transferable than the facts and ideas themselves.

4. *Frameworks* are really complex packages of ideas and methods fitting together in some logical way (internally consistent). They may or may not be based on facts; claims are usually highly exaggerated when made by advocates for a particular framework. Nevertheless, frameworks can be extremely useful for developing countries

in providing rudimentary procedural configurations and rationales both for the use of authority (the 'A' factor of chapter III) and the achievement of consensus (the 'C' factor). Included in the category of frameworks would be the various ideological schemas of left, centre and right, economic theories, descriptions of ideal programmes or processes for planning, evaluation, training, creating open learning systems, non-formal education, lifelong education, etc. Many of these schemas are extremely vague, constituting little more than slogans or rallying points for collective action and international co-operation.

5. *Combinations*. Almost all other knowledge types can be derived from various combinations of the above four categories. For example, the recent Unesco volume on the Experimental World Literacy Project constitutes a complex package of all four types. There are some dominant frameworks, principally that of the 'functional literacy' ideology and of the comparative pilot project approach to development. Then there are various facts, some assembled from questionnaire data in quantitative form, but inevitably with shaky foundations. Again, there are the methodologies (a) of the projects themselves, (b) of the macrodesign of the mammoth, worldwide project, and (c), not to be ignored, the modest, sensible and rather convincing design of the volume itself, presenting a number of case studies in reasonable depth, followed by a comparative analysis of major factors. Finally, such a book also contains many hundreds of ideas, some very conjectural, about what happened, what ought to have happened, what could never have been expected to happen, etc.

Sources of technical knowledge

Technical knowledge can also be classified according to its sources. We suggest at least five generic categories, namely 'settings', 'institutions', 'vendors', 'knowledge storage centres', and 'personal networks'.

1. *Settings* represent the rawest source of knowledge, the place where the events take place, where the innovations are generated and implemented, where the education goes on, etc. There are three important sub-categories of settings, namely (a) one's own setting, (b) a setting in the proximate environment, and (c) a setting in the remote environment. Presumably source (a) can be tapped merely by opening one's eyes, exploring one's past experience, analysing one's present experience, etc. But important as it is, it is not so easy to gain access to this source and few make a sincere and persistent effort to do so. Source (b) should also be readily accessible but there are at least two problems: first, many people do not have the diagnostic and analytic tools at their disposal ('method'-type knowledge) to make sound judgements based on the evidence of the proximate environment; the second difficulty is the tendency for many people to downgrade their proximate resources as being either too obvious or too unworthy as the raw material for great innovations. This tendency is probably most pronounced under what we have called the 'alternative of grandeur' pattern described in chapter III. Remote settings, on the other hand, are equally problematic. To experience remote settings we must first make a site visit, i.e. go directly to wherever the innovation is taking place to examine what is happening with our own eyes. There is little doubt from studies in developing and developed countries that such site visits represent a powerful medium for the spread of innovations.

2. *Institutions* (including governments, schools, ministries, international organizations, universities, institutes, etc.) constitute the largest source of official information governing the daily work lives of people. Laws, curricula and various rules and regulations related to the running of schools have institutional sources; this would include a great deal of the technical information relevant to making innovations in the schools.

Institutional sources tend to be impersonal, cumbersome, inflexible, and sometimes threatening, but they need not be any of these.

3. *Vendors* include manufacturers, distributors and suppliers of educational information, books, equipment, technology and facilities when these sources have a special interest (e.g. financial gain) in distributing as much as possible to as many as possible. Hence, while most vendors have an institutional base, they tend to act in very different ways. They tend to be more rapid and flexible and less threatening; they are frequently more efficient. On the other hand they tend to cover only a small spectrum of needs, and they provide information which is biased in favour of their product. The activities of vendors are greatly restricted in some cultures, especially in the field of education.

4. *Knowledge storage centres* such as archives, libraries, data banks, media and material centres, etc. are a type of source which may assume greater importance in the future. They are, of course, institutions which specialize in information storage. Hence they hold the promise of being general and comprehensive sources of technical information on any subject in the entire spectrum of user needs. Very few if any existing storage centres can meet such expectations today, however, and this will be even more true of the developing world. The most highly developed system of this kind is the Educational Resources Information Center (ERIC) supported by the United States Government and intended primarily for users within the United States. Storage centres have the advantage of being unbiased, of covering a range of needs and situations, and of affording the user freedom of access and freedom to choose his own information selectively according to his own pattern of needs. On the other hand, they are usually restricted to information in print form, they are impersonal, often incomplete, and awkward to access, especially from rural and remote areas.

5. *Personal networks* are probably the most commonly used source of information about educational innovations, and most certainly they are the oldest. Personal networks tend to have high credibility (in spite of a tendency to bias), are by far the easiest and most rapid to access, and are the most flexible sources of information. A great deal of the knowledge which is actually used in innovations is stored in the heads of various key persons in social networks. The most significant group in this category for major national innovations is the international educational *expert* network, a group of perhaps 1,000 persons mostly from developed countries who are called upon again and again to go on missions, to make case studies, evaluations, comparative reports, etc. based on their presumed expertise and experience. They are typically associated with some university in the developed world but they frequently attend international meetings, travel extensively, and meet and discuss topics in vogue. They do not represent any one international agency but typically work for several, either concurrently or over a period of years. Unesco is probably the largest single institutional support agency for the network, but the World Bank, Unicef, OECD and various private foundations are also important. The network is not clearly connected to knowledge storage centres and it is not always clear how the reputation for expertise is established and maintained. There are also networks of international civil servants and officials which overlap the expert network to some extent. Within any country, particularly a large and highly developed country, there are likely to be similar overlapping networks of experts and officials.

The forms and media of knowledge transmission

To some extent the forms or media of transmission of knowledge follow the types of sources listed above. For example, if a 'setting' is the source, then the primary medium is direct observations.

1. *Observations* can have very high credibility, high involvement, and can convey a very great amount of information, provided that the user knows what to look for and how to interpret what he sees. Disadvantages of direct observation are largely logistical: e.g. how to arrange for access to settings, especially remote settings, how to arrange or exhibit those aspects of the setting which are most representative and most important (i.e. how to organize a demonstration), how to sample activities in an ongoing setting so that excessive time is not spent by the observer in making redundant observations. Another problem with observations is the potential intrusion of the observer upon the observed. Settings which are frequently or continuously exposed to the observation of outsiders can be altered, sometimes radically, by this very fact; therefore, one of the tasks in arranging for direct observation is the minimization of obtrusiveness.

2. *Oral expression* (including most forms of consultation, discussion, rendering of second-hand observation, opinion, advice) is by far the most frequently used medium of communication in all cultures, but its use increases greatly as literacy decreases and as the availability of knowledge in other forms decreases, e.g. in rural areas, isolated areas, less developed areas. Oral channels are relied upon heavily even in the most developed countries as a check or evaluation of information which comes in print or other forms. Even the most sophisticated networks, such as the international expert network mentioned earlier, rely heavily on the direct oral medium both for communication among themselves and for communication with their clients. Oral media can be the most informal, the most flexible and the most efficient dialogue, feedback to the source and communication to the source of current user need. On the other hand, they are inefficient and unreliable for conveying (a) highly technical information, (b) complex ideas, models, and scientific methods, and (c) even simple messages which must be conveyed very quickly to a very large and dispersed audience. Personal sources are also likely to be biased in spite of their relatively high credibility and they may tend more often to reinforce the *status quo* rather than promote change because of the stabilizing, levelling, and consensus-conformity building function of the informal social network.

3. *Print* (including all forms of books, newspapers, manuals, newsletters, journals, memoranda, letters, etc.) generally has advantages and disadvantages which are the inverse of oral media. The prime advantage is the capacity to transmit large amounts of information, sometimes of a highly complex and technical nature, in a reliable and complete manner. Indeed, it is often not realized that almost all forms of medium and higher hardware technology depend heavily on print media both for transfer and maintenance (e.g. via plans, blue-prints, specifications, flow diagrams, instruction and maintenance manuals, etc.). Print is also the only *reliable* form in which knowledge can be stored for future use or re-use. On the other hand, print media have many shortcomings as transmitters of knowledge about innovation. They assume not only literacy, as a precondition of use, but also the availability of paper, printing equipment and distribution channels, all of which may be problematic in developing countries even though they are taken for granted in almost all developed countries. Furthermore, print media (except for the slow and cumbersome process of letter communication) do not allow feedback or dialogue between the source and the user. Print media are also usually poor vehicles for motivating and involving users even when they are literate, and they are an inefficient and ineffective medium for gaining wide awareness of relatively simple but important ideas.

4. *Products* (including low technologies such as paper, pencils, slates, chalk, utensils; medium technologies such as cameras, projectors, radios, recorders, curriculum kits, and telephone; and high technologies such as video recording and viewing equipment, computers) have special advantages over all of the types of media listed above. For

example, unlike direct observation they are usually transportable, allowing demonstration in the users' immediate proximate environment. They can also have a highly stimulating, motivating effect. Low technology products do not depend upon literacy as a precondition and can be introduced very quickly into the user's problem-solving configurations, sometimes with startling results, either positive or negative. Rogers and Shoemaker (12) cite the case of the introduction of the steel axe into Australian bush cultures; the axe replaced long-embedded and highly laborious ritual behaviour for accomplishing the same ends but requiring co-operative and extended labour. When this activity was no longer necessary, the traditional culture was undermined. People sat around idle when they no longer had work to do and began to compete and quarrel among themselves when they were no longer required to act co-operatively.

Products have the advantages of being visible, manipulable, demonstrable, and apparently immediately usable. Partly for these reasons they play a large part in the 'alternative of grandeur' approach described at length in chapter III. In fact the different levels of technology have equivalent effects upon the different levels of the user system: at the classroom-student levels the lowest technologies probably have the most impact and the most potential; at the level of teacher training and regional provision of resources, the medium technologies seem to hold the most promise; at the ministerial-national level the high technologies seem most promising and 'tangible' because of the seeming availability of large sums in foreign exchange to buy equipment, and of large numbers of high-level technicians who can be summoned by Unesco or other benefactors. The illusion is that these products stand on their own; the reality is that the higher the level, the more complex the required infrastructure of support and the more extensive and technical the print base (software) required for both maintenance and transfer. Problems associated with the introduction of medium and high technologies are well discussed by Shumacher (13) and by Schramm (14). Finally, it should be noted that the sources for most (not all) products are *vendors*, with the the attendant advantages and disadvantages which this implies.

5. *Electronic media* are coming to have a very important role in the transmission of knowledge in developing countries. Radio receivers in particular have become so widely available at such low cost that they can reach the most remote rural areas of a country. Radio is an excellent medium for creating *awareness* of innovations, for highlighting needs, and for building a sense of national unity, and motivating joint action around broad goals. Radio study group campaigns, especially when well-conceived, elaborately planned, and harmonized with other media (print materials, simple products, specially trained and motivated discussion leaders) as they have been in Tanzania (15) can actually play a significant role as part of the formal and non-formal systems of education. However, even with radio there are certain shortcomings. First, unlike direct oral forms, radio has no capacity for feedback unless special and sometimes quite complicated provisions are made. Unlike print forms, radio is unable to convey a large or even a moderate quantity of technical information. Also unlike print media, radio has minimal possibility for storage of information for re-use at the moment of trial of the innovation itself. Finally, radio may be seen as a rather remote source without the persuasive impact of personal communication from an opinion leader.

Television appears to have some significant advantages over radio as a medium for demonstrating an innovation, particularly an innovation in product form; it is also somewhat superior in its capacity to relay complex and technical information in moderate quantities and without too many supporting print materials. On the other hand, its storage capacity is essentially nil and it lags far behind print as a technical medium except in its capacity to show movement. With these modest advantages weighed against the special disadvantages of high technology, for poor countries the case against television becomes overwhelming, at least in the short term. The major exception may be those developing countries with the special configuration of very rich resources (usually petroleum) and moderate population.

Telephone communication has certain unique and too-little exploited advantages over all other types of media. First, it substitutes effectively for face-to-face communication, allowing the use of very remote expert resources without the cost and time-waste of travel. It also allows immediate dialogue about needs and solutions; it is very flexible in time, allowing repeated follow-up contact after reading, trial, practice, or various information search and diagnostic strategies have been attempted. It is also extremely effective in linking one expert with another, hence serving to strengthen expert networks and the interconnexions between expert and official networks. Despite all these advantages, however, the telephone rarely receives much attention in discussions of knowledge acquisition strategies even in the developed world. In developing countries there is the obvious problem of the technical infrastructure. It is conceivable, however, that the telephone may provide such important and unique advantages for economic, social, and educational development that its accelerated diffusion and adoption should be encouraged.

6. *Training events* (including courses, seminars, topical conferences, extended briefings, indoctrination sessions, etc.) should be included in this list because of their frequent use as transmission media, although they really represent complex combinations or packages of the other forms and media listed above, in particular oral and print forms. Training events are, in fact, particularly important because they provide the opportunity for prolonged exposure to various media in combination; hence they are potentially the most effective medium, certainly having the greatest capacity to change or develop attitudes and behaviours and to transmit very large quantities of highly complex and technical information. They also provide multiple opportunities for dialogue between sender and receiver, for redundant communication of the most important messages, for practice, for synergy of sight, sound, feel and action. With all these pluses it is not surprising that training events play a major role in many development projects. On the other hand, the opportunities afforded by training events for incorporating all the above features are rarely exploited since the focus is almost always on the contents of the training and not the process.

Alternative uses of technical knowledge

Within the context of this book, our primary interest is the use of technical knowledge to promote educational innovation or more precisely to *improve* educational practice. We have further assumed that the user or adopter of innovations, whether he be in the classroom or in the ministry or at some intermediate level, is a problem solver or a problem-solving system; he (or she) does not sit passively waiting for the innovations to come; rather he is engaged in a continuing struggle with problems, needs, inadequacies and imperfections. In our conception of the active user we can envisage at least nine important and distinct ways in which knowledge can be used. Each use may call for a different type of knowledge, from a different source, in a different form or medium.

1. *Diagnosis*: information to help understand one's own situation, one's own needs and deficits. The most relevant knowledge type required from outsiders may not be facts but rather *methods* to help guide self-inquiry and observation.

2. *Awareness*. Here the user's purpose is to enlarge his range of thinking about possibilities. The primary knowledge type may be 'ideas', the source could be vendors,

settings or personal networks, the medium could be radio, newspapers, or oral communication. Books, technical materials and knowledge storage facilities are rarely very effective for this purpose.

3. *Setting goals*. Users, especially at the local level, get very little practice in setting goals or in examining their needs in a way that enables them to do so. One problem may be that few people realize how much they can control their own situation, assuming that goals are set somewhere else (usually at a higher, bureaucratic level). Facts, ideas, methods and frameworks can all be very useful for goal-setting. Most of all, the user needs to develop a conception of himself (or herself) as a problem-solving system.

4. *Management procedures*. The most common type of knowledge required here is methods and the most common source is institutions. Information may be sought or acquired regarding such important steps in the innovation process as (a) planning, (b) start-up, (c) maintenance, (d) diffusion, or (e) evaluation.

5. *Construction and preparation* usually requires both products and print materials (guides, manuals, specifications, parts lists, etc.) as well as training and oral guidance. Knowledge storage centres can become particularly important as reference sources when blockages are encountered at this stage of problem solving.

6. *Installation*. What may be most needed here is the personal assistance and moral support of another person, especially someone who has already been through the effort of installing the same or a similar innovation.

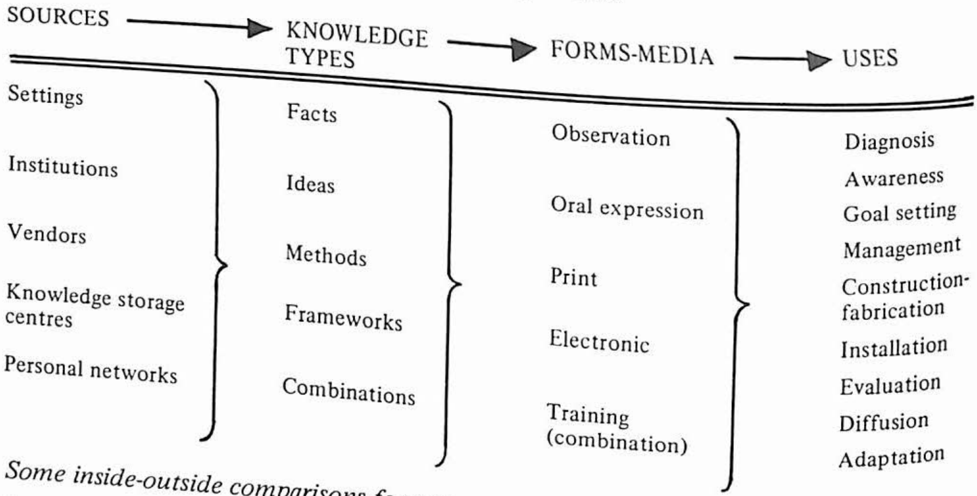
7. *Evaluation*. Both facts and methods are very much in demand when the user seeks to determine either whether he should try an innovation (evaluation-before-trial), hopefully based on data from a remote but equivalent setting) or whether the innovation he has just tried was really effective and useful. In the latter case, if the investment was large and the consequences potentially far-reaching, he might want to call upon the skills of an expert in evaluation from inside or outside the country. The case study literature reveals few instances where such technical assistance was eagerly sought.

8. *Diffusion*. Assuming a successful innovation and a desire to spread beyond the original trial site or pilot project, there is a wealth of information which could be drawn upon regarding diffusion media and strategies. Again, this reserve of knowledge is rarely called upon by practitioners when they reach this stage of an innovation project.

9. *Adaptation*. Perhaps the most difficult information to acquire concerns the various ways in which innovations can be transformed, moulded, dismantled and reassembled to provide a closer fit to the user's special needs and requirements. This type of information is almost inevitably in the 'idea' category and it usually can only come from oral communication with a knowledgeable and empathic expert or colleague.

This extended taxonomy of knowledge transfer elements (summarized in Figure 30), i.e. types, sources, forms and uses, is provided as a necessary introduction and qualifier for the rather sparse and simplistic data which follow from our survey. Special issues are raised by each type, each source, each medium, and each use. Throughout all these categories also run the fundamental issues regarding openness to inputs, summarized in Figure 29, above all the ambivalence of users regarding remote (outside) and proximate (inside) resources. To bring all these issues to a focus and give them proper treatment obviously requires a book in itself. Certainly there is no existing source which provides comprehensive coverage of all these issues and certainly none which can serve as a practical guide to the innovator in the field.

FIGURE 30. A brief taxonomy of technical knowledge transfer



Some inside-outside comparisons for resource use by teacher training projects

Inside-outside was probably the most salient theme of our survey of Unesco-UNDP teacher training projects, starting with the fact that approximately half our sample were 'chief technical advisers' (outsiders) and the other half, national project directors (insiders, at least to the country concerned). One major block of questions focused on the acquisition of technical knowledge, comparing acquisition with use, inside with outside and print with other types of media. The over-all pattern of findings is quite complex but is largely summarized in Table 6.4.

The three figures in each row under 'effort' and under 'usefulness' should add up to 100 per cent (sometimes 1 per cent more or less due to rounding). The figures in parentheses represent the percentage of our total sample of 81 experts who took part in the survey. More people responded to the questions on 'effort' than to the questions on 'usefulness' and among individual items there are wide differences in response rate. We believe that these discrepancies are due to two factors: first, a slight misunderstanding or misinterpretation of these items by some of the respondents so that they placed only one check per row instead of two, and, second, the fact that these items were not given the highest priority when the questionnaire was administered.

In spite of these shortcomings, the responses do suggest some interesting findings. First of all, it is clear that there is a very heavy reliance upon *experts*, with outside experts being viewed with slightly more favour. Both inside and outside experts also received by far the highest ratings on usefulness. Apparently, however, it was the source and not the medium which was most crucial since 'teachers and teacher organizations' received one of the lowest ratings on effort and the lowest rating on usefulness. It appears that local (proximate) and less prestigious sources are downgraded by these respondents.

Next to experts, books on education for development receive high ratings both for effort and usefulness. However, it appears that books and documents on more specific projects are not viewed favourably. Most surprising is the low amount of effort devoted to site-visiting either inside or outside the country. It is noteworthy that all items mentioning 'similar projects' get low ratings; this may imply a reluctance to believe that the project is not unique and that useful information can be obtained elsewhere, profiting from the experience of others.

It should be noted that items a, c, e, i and j represent relatively remote (outside)

TABLE 6.4. Acquiring technical knowledge for Unesco-UNDP teacher training project: a comparison of effort and utility for different sources

What different sources were used to obtain technical knowledge for the planning and implementation of the project? (Check all which apply.)

	Source	Effort expended to acquire knowledge				Usefulness			
		High effort %	Some effort %	No effort %	Ans. Quest. %	Very %	Somewhat %	Not at all %	Ans. Quest. %
a	Experts from outside the country	63	36	0	(94)	72	28	0	(70)
b	Experts within the country	55	42	3	(86)	72	24	4	(67)
c	Site visits to similar projects in other countries	23	52	23	(65)	33	44	22	(44)
d	Site visits to similar projects within the country	21	39	39	(41)	33	43	24	(26)
e	Documents on similar projects in other countries	24	61	15	(67)	32	54	14	(62)
f	Documents on similar projects within the country	28	36	36	(44)	34	38	28	(35)
g	Teachers and teacher organizations	21	48	31	(59)	28	53	19	(40)
h	Professional staff of existing teacher training organizations	34	49	17	(65)	40	49	11	(43)
i	Books and documents on various aspects of teacher training	34	55	10	(72)	47	51	2	(56)
j	Books and documents on education for development	42	44	14	(75)	50	38	12	(59)

sources of information whereas items b, d, f, g and h represent relatively proximate sources. Over-all there is very little difference in perception of inside and outside sources either on the effort or usefulness scales. There is a slight tendency towards favouring external sources but most of this difference results from the last two items (books and documents on training and development). It may also be noted that almost no differences were found between our outside experts (chief technical advisers) and inside experts (national directors) on any of these resource-use questions. Both findings tend to contradict the literature on development, which contains many references to the difference between insiders and outsiders, the errors and insensitivity of outside experts and the irrelevance of their knowledge. It is possible that our sample is too narrowly restricted to reveal such differences, especially since all our respondents could be regarded as experts and all were no doubt outsiders as far as local practitioners in the schools within each country would be concerned.

From further statistical analysis of these items we discovered that the use of inside and outside resources were correlated with each other to a reasonably high degree (r = .35). In other words, people who made much use of inside resources tended to use outside resources also and vice versa. Furthermore, there were high intercorrelations among the various resource use items, i.e. those who made high use of books also made high use of site visits, experts, etc. Table 6.5 lists some of the more interesting relationships between these variables and other items in the survey, many of which we have discussed previously. The heading 'outside resources' represents the combined average of items a, c, e and j from Table 6.4 whereas the heading 'inside resources' representes the average of items b, d, f and h. Data are Pearson Product-moment correlations. Possible range is −1.00 to +1.00. Levels of statistical significance are roughly as follows: $p < .05$: .22; $p < .01$: .29.

TABLE 6.5. Inside and outside resource use compared to other project aspects

	Effort to acquire: outside resources r =	inside resources r =
National financial contribution	.44	.26
UNDP contribution	.21	−.22
Number of persons to be trained	.20	.14
Asian Region	.15	.37
Sub-Sahara Africa	−.14	−.23
Use of many media	.47	.26
Objectives defined with outside help	−.22	−.05
Amount of effort to *evaluate* project	.31	.16

Table 6.5 indicates first of all a rather surprising relationship between technical and financial resource use. The amount of the *national* contribution is most predictive of the amount of use of *outside* technical resources. Furthermore, it might appear that the amount of international funding slightly discourages the use of *inside* resources. Number of persons to be trained is only slightly affected by the resource acquisition effort.

The geographic pattern strongly confirms the analysis of chapter III regarding Asian projects: they are much less likely to rely on external sources, tending toward the 'expansion' and 'local' models. African projects show some tendency to reject inside resources, opting more frequently for 'grandeur' or 'crusade' approaches. The 'crusade' approach pays very little attention to the resource acquisition process.

This table also shows a strong relationship between the use of outside resources and the use of various media to communicate with the people regarding the innovation. This suggests that one major reason for acquiring information is the need to communicate with others. On the other hand, aggressiveness in resource acquisition does *not* indicate a dependence on outsiders; in fact, the reverse may be true, at least regarding the definition of objectives. Finally, it may be noted that use of resources is related to total effort invested in evaluating the project. Reflecting briefly on our taxonomy of information uses, it appears that outside knowledge is acquired for 'awareness' and for 'evaluation' but less so for 'setting goals' and probably for 'diagnosis'.

Before taking a final look at these data and interpreting them, it will be useful to turn briefly to our various other information sources for some more wisdom, particularly on the roles and comparative value of outside and inside experts and their knowledge.

OUTSIDE EXPERTS: THEIR USE, ABUSE AND MISUSE

The most unsatisfactory pattern of use of outside experts was one which placed them in commanding or initiating roles. In either case, once this happens it is difficult for nationals to develop the necessary involvement and sense of ownership to integrate the project in the system. The Upper Volta case is outstanding in this regard:

> Establishing a proper role for a rural education program and making it a key element in a national endeavor to provide basic earning opportunities to all children and youth call for a national commitment by political leaders, the administrative personnel, and the general public. Similarly, making a rural educational program an essential ingredient in a rural development thrust requires an environment of willing and constructive support. Without attempting to pass judgement on the Upper Volta rural development activities and the total educational system, it may safely be said that the REC does not enjoy the unequivocal support of the government. The objectives and rationale of the program, which was originally conceived in colonial days mostly by expatriates, have always been the subject of debate and the program still remains officially labelled 'experimental' even after more than ten years of existence. (16)

Grabe makes the case that in many respects the non-formal plan for Upper Volta was well conceived and certainly original but the very fact that it was not really locally generated led to a very inadequate implementation effort.

Sometimes, the direction of a project ends up in the hands of outsiders by default. Lallez notes such a phenomenon in his case study of the IPAR project in the United Republic of Cameroon. (17) The appointed national director of this project, who was also the director of primary education, was far too busy to carry out his duties; hence they were assumed by the CTA.

From analysis of a number of evaluation reports of various Unesco projects, a profile of the more successful outside expert emerges as follows. 1. He is able to work co-operatively with national counterparts; it is clear that a great deal of the outsider's success rests on good interpersonal relations, and on skills in relating to people on a one-to-one and one-to-small group basis. 2. He works hard to transfer his skills to his national counterparts. Most outside experts realize in principle that they must do this, but it can be difficult both technically and psychologically (in that the expert must demystify his expertise and lose some of his special power in the process).

3. He must *adapt* whatever knowledge and skills he has to the particular situation; in the process he may find that most of his specialized knowledge is useless; the real need may be in areas outside his competence, thus forcing him to don the mantle of generalized, mystical 'expert' or to resign in favour of some other. He may also find that his skills as an experienced observer and consultant to *projects in general*, i.e. his knowledge of the process of change, is far more relevant and useful than his special knowledge of the content area. 4. Finally, the effective outside expert must be able to bring to the situation skills and knowledge which are both relevant and unique, i.e. not possessed by the locals already, and not available from the home government.

Although the above four broad points are fairly well substantiated in our interviews, it is also clear that we are a long way from a satisfactory and comprehensive formula for the successful expert. There are at least two major dilemmas which need to be resolved regarding this problematic role. The first may be stated as follows: how much professional authority should the international expert exercise in determining goals and priorities? Our survey data suggest that determination of goals by outsiders leads to a very negative pattern of implementation. Yet the international expert is sometimes in a position where he knows the innovation more clearly and has had much more experience with its effects in various settings than his national counterparts; does he sit idly by, letting his colleagues make decisions which he knows will be catastrophic? Should he wait to be asked, and should he respond only to needs which are explicitly stated to him? Some experts in some situation have clearly answered 'yes' to both these questions. One CTA who found himself caught up in a 'crusade' type project saw his role as 'keeping them on the rails', attempting to inject a note of realism into plans and projections. Yet he felt that his advice was totally ignored by key officials. In frustration and in a need to protect himself from blame for what he clearly saw would be later failures, he began to put all his advice in writing perhaps in the process further alienating some of his national counterparts.

A second major unresolved issue regards the level and the stage of the problem-solving cycle at which outside expertise should be inserted. Should the outsiders be used as (a) conceptualizers, (b) planners, (c) leaders and managers, (d) catalysts or stimulators of change, (e) technical problem solvers, (f) linkers and co-ordinators among various levels and interests within the project, (g) linkers to various sources of outside knowledge including the international organizations and projects in other countries, (h) linkers to expertise in the developed world, or (i) technical assistants and gap-fillers? All too often they are seen in the last category without any clear conception of how else the gaps might be filled once the outsiders leave. Here is an example from the case study of the Jamaican residential camps for out-of-school youth, reported by Prosser, who writes that, over a period of years, expertise in technical training was provided by overseas volunteers from developed countries who were continually replaced by other outside volunteers after a short period of service.

> The agencies that have helped in this way have included the US Peace Corps, Canadian Universities Service Overseas (CUSO), the West German Volunteer program, and the British Voluntary Service Overseas (VSO). Since 1972 bilateral programs have been superseded by a UN volunteer program in agreement with UNDP, which provides for 20 international volunteers on two-year assignments to help primarily with vocational training. In 1972 eleven volunteers of the twenty were in post, although as part of the agreement their Jamaican counterparts had yet to be appointed. These new personnel should have ameliorated the staffing difficulties in the camps. (18)

Clearly this was not an efficient use of outside expertise. Part of the problem was the failure to provide national counterparts, but another serious question concerns the level at which the expertise is introduced; here it is clearly at a fairly low and operational level of the project, and even when and if the national counterparts arrive, there is no provision for their replenishment or for the further training of other vocational educators to expand these programmes to serve a larger segment of the Jamaican population.

Of the various possible roles for the outside expert, we feel that the three 'linking' alternatives (f, g and h) mentioned above deserve much more attention. It is clear from our survey data that decision makers in developing countries put tremendous credence and reliance upon the international expert network. It therefore becomes a matter of world priority that this network be firmly anchored to the best sources of information that the world has to offer and that they act as conveyors of and linkers to these sources.

INSIDE EXPERTS: WHERE ARE THEY AND HOW CAN THEY BE CREATED?

Much of what has been said about outside experts may apply with equal force to inside experts. The survey showed (Table 6.4) that inside experts are sought with almost equal vigour, and their technical knowledge is often valued almost equally highly. In fact, when such insiders are available their use avoids some of the problems of outsiders. First of all they speak the language; they understand the customs and folkways; they are more likely to have an empathic attitude toward problems, needs, and resistances to change. Most of all, they do not go away after a period of one, two or three years' service.

These points are obvious enough but when we go beyond them, we are entering the area of pure conjecture because, unfortunately, very little appears in the literature regarding the role of the inside expert. Hence, the analysis and conclusions of this section must be taken cautiously. We hope that, in the future, case study authors will take seriously our dichotomy of inside-outside resources and experts and will treat the former with as much depth and perceptiveness as they have treated the latter.

The major problem with inside experts in developing countries would appear to be that there simply are not enough of them to go round. The logical solution, therefore, is to create them through various kinds of training programmes, hence the importance attached by Unesco and UNDP to the development of teacher training programmes and centres. However, the training of experts at the highest level presumably requires facilities, faculties and institutions of the highest calibre and longest experience, i.e. those found only in the most developed countries. Sure enough, almost every major university in the developed countries of the world, whether socialist, capitalist, or unaligned, has a major programme for training people from developing countries in all skill areas at the highest levels. Unfortunately, however, there is considerable doubt as to the wisdom and efficiency of creating corps of national experts in this way. There are at least three major difficulties on which various authors have commented. The first, and perhaps most serious, is that many such experts never come back to their native countries, finding the rewards and life-styles of their host countries far more appealing. Secondly, even for those who do return, the cost is tremendous, not only in economic but also in personal terms. People are literally uprooted from their families and from their native cultures, forced to adapt totally to a second or third language as well as to a strange culture, a process which in itself may take a year or longer. It is not surprising, under the great and prolonged stress, that many are expatriated while many others return home without completing their training to a level of mastery sufficient to qualify themselves as trainers or expert consultants in these same fields. It is furthermore little wonder that some experience a third difficulty, alienation from their fellow countrymen, adopting the life-style, habits and attitudes of their hosts and ceasing to identify with the genuine needs and aspirations of their homeland. Hence they become what Axinn and Kieffer call 'pseudo-insiders' (19), with all the shortcomings of outside experts mentioned earlier and only the appearance of 'insideness' (of course, even the appearance of 'insideness' may increase the effectiveness of an expert). A fourth difficulty with outside training of long duration may be that the trainee, particularly the older trainee, loses his roots in the system, like the old soldier who has gone off to war, returning to find others have taken his place in the scheme of things.

A fifth, very important problem with high-level, outside training, related to the others, is that the returning 'expert' may not want to play the role of expert in the field of his training but may gravitate instead toward higher and higher administrative positions which provide greater financial and prestige rewards.

It seems fairly obvious to conclude that institutions and training mechanisms must be provided *within* a country or, at least within the developing world itself, to avoid the problems enumerated above. In our review we came upon two excellent models in this regard. One, to which we have referred earlier, was a very successful collaborative training project among a number of Caribbean Island nations, under Unesco sponsorship. The project placed great emphasis on self-help and collaboration among the Caribbean nations as well as upon outside experts. Each expert had as many as four counterparts or 'co-tutors' who worked alongside him as a team, producing materials and so forth.

The other very significant model which comes to mind as a promising way to build indigenous expertise is provided by the Asian Programme for Educational Innovation and Development which was initiated at the Unesco Regional Office for Asia in 1973 with major support from the UNDP and subsequently the Japanese government. This programme is emphatically *not* designed to import expertise to Asian countries from the west or even from Japan. Rather it is a decentralized project, emphasizing simultaneously the idea of national self-help and regional building and sharing of expertise. A central theme is the development of overlapping networks of Asian experts in various educational fields of special priority to Asian countries. Another focus is the development of national centres of research and training which specialize in one or another topic and become the focal point for regional information dissemination and training. Within each Asian member country there is also supposed to be the development of national networks of experts and practitioners corresponding to the growing international network. This experiment in international co-operation may yet be too young to be evaluated fairly but it seems to hold promise of solving many of the problems of creating 'inside' experts. (20)

WHAT IS AN OPTIMUM STRATEGY OF RESOURCE ACQUISITION AND UTILIZATION?

Returning now to our survey data, we may be in a position to define what might be called an 'optimum' or perhaps 'most sophisticated' pattern of use. By means of the statistical manipulation known as 'factor analysis' we were able to come up with a cluster of variables which represented the strongest interconnexions among the many items which reflected acquisition and use of resources in one way or another. In Table 6.6 we present key items in this 'factor' which we call 'use of sophisticated resources'. Items are listed in order of importance or strength of association with the factor as a whole. While their technical designation is 'loadings', they can be viewed as equivalent to 'correlations' (r). The possible range is again +1.00 to −1.00. The lower half of this table provides further correlations between this factor and other parts of the questionnaire. For this purpose the 'factor' was defined as the sum of the seven highest loading items taken as one score and correlated in the usual manner (Pearson r) with these other variables.

TABLE 6.6. The sophisticated resource use pattern

Item	Degree of relationship to the factor
Effort expended to acquire:	
Books and documents on education for development	.71
Documents on similar innovations in other countries	.61
Site visits to similar projects in other countries	.58
Site visits to similar projects within the country	.53
Experts from outside the country	.50
Most strongly related other variables:	
Use of quantitative written reports for evaluation	.51
Over-all effort to evaluate the project	.41
Systematic collection of (evaluative) data	.38
Need for project expressed via television	.37
Project had a distinct 'planning' phase	.37
Use of all types of media (combined index)	.37
National financial contribution	.31
Objectives defined with outside help	−.30
Social interaction strategy (using opinion leaders, informal channels, etc.)	.28

This cluster is described as 'sophisticated' because of the obvious use of books and documents *in combination* with site visits and discussions with outsides experts. It is noteworthy that use of *inside* experts is not at all related to this cluster (r = −.06). The correlations with other items on the questionnaire confirm the label 'sophisticated'. It is associated with an emphasis on both planning and evaluation. It is also associated with *higher* levels of financial commitment by the country itself but *not* by the international agency (r = −.09). It is clear that, under this pattern, initiative lies with the *nationals* since it is negatively associated with participation by outsiders in forming objectives. Finally, it is moderately associated with the use of opinion leaders and informal channels in combination with all sorts of media (radio, speeches, pamphlets, etc.) reflecting the kind of 'synergic' approach to the diffusion of an innovation which is derived from extensive sociological research on this subject (exemplified by the work of E.M. Rogers).

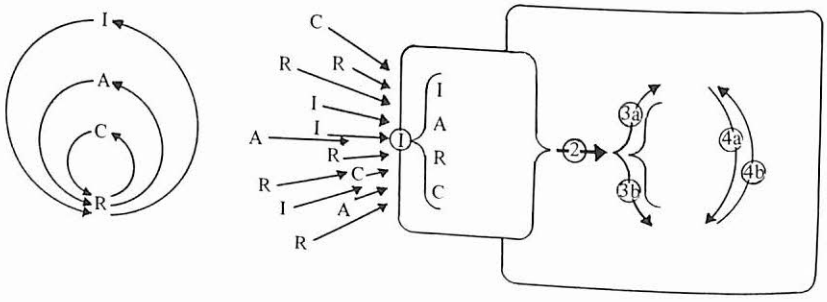
This analysis suggests that there may be a far more positive approach to innovation than that suggested by any of the four patterns depicted in chapter III. It suggests that nationals can be fully in charge of means and ends, following a participative, problem-solving approach, yet still make maximum use of the best external knoweldge and expertise available. Further research is necessary, however, not only to confirm the existence of such a positive pattern but also to provide evidence of its effectiveness, especially in the longer term.

RESOURCES AS AN ELEMENT IN SYSTEM DEVELOPMENT

By way of summary, it will be useful to return to both the system description provided in chapter II and the I-A-C formula of chapter III. Resource acquisition represents the efforts of a system to *complete* itself or to move to a new level of development through the incorporation of new elements or processes. These new elements or processes come from either the proximate or the remote environments. In either case, all systems are necessarily ambivalent about inputs, recognizing that while they may be necessary for growth and even for maintenance, they can also be disturbances and even destroyers of the system as it stands, and undoers of the level of system completeness which has been achieved so far. Out of this ambivalence comes the necessity of developing elaborate screens or filters for processing inputs, sorting them, analysing them, evaluating them, and transforming and adapting them for ultimate use. Such elaborate input procedures require separate input subsystems with their own procedural configurations, their own specialists, their own resources, their own authority, and their own special needs for internal consensus and equilibrium. As noted before, the innovation project itself may be viewed as one kind of specialized (and usually temporary) input subsystem.

In chapter III we introduced a simplifed and descriptive model of four system elements, Infrastructure (I), Authority (A), Consensus (C), and Resources (R), proposing that each could be used as a very rough scale (+ or −) to arrive at various descriptive configurations of over-all system health or well-being. To further simplify the discussion at that point, we withdrew the 'R' element, noting that it is almost always a deficient element in developing countries. However, it may now be appropriate to reintroduce this term. Resources are literally what a system lives on, but at the same time resources are what a system produces. Infrastructures come into being to acquire, create, distribute and consume resources. Authority commands resources. Consensus pools resources. Figure 31 suggests this relationship. It is also true to a great extent that resources can substitute for deficits of I, A, or C. Hence an innovation project, as a package of resources, has the task of making up for deficits in the existing system in either I, A, C, or R with the usual emphasis on I and R and making the (often untenable) assumption that there is an A + and a C + situation. This assumption is often made for politically pragmatic and diplomatic reasons, respecting the integrity and validity of the existing socio-political 'system'. Hence, a typical international technical assistance project might be configured roughly as in Figure 31b.

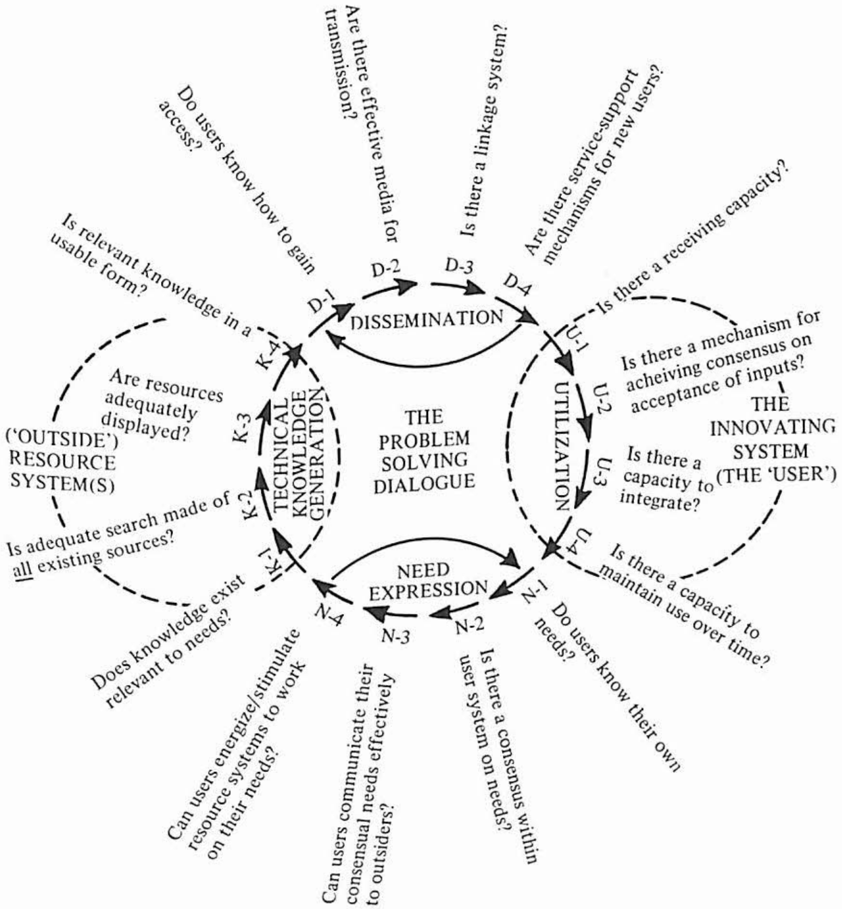
FIGURE 31. How resources (R) relate to infrastructures (I), authority (A), and consensus (C)



(a) in general;

(b) as embodied in innovation projects.

FIGURE 32. The complete user-resource dialogue: 16 steps


THE PROBLEM SOLVING DIALOGUE
DISSEMINATION
UTILIZATION
NEED EXPRESSION
TECHNICAL KNOWLEDGE GENERATION
('OUTSIDE') RESOURCE SYSTEM(S)
THE INNOVATING SYSTEM (THE 'USER')
D-1
Do users know how to gain access?
D-2
Are there effective media for transmission?
D-3
Is there a linkage system?
D-4
Are there service-support mechanisms for new users?
U-1
Is there a receiving capacity?
U-2
Is there a mechanism for acheiving consensus on acceptance of inputs?
U-3
Is there a capacity to integrate?
U-4
Is there a capacity to maintain use over time?
N-1
Do users know their own needs?
N-2
Is there a consensus within user system on needs?
N-3
Can users communicate their consensual needs effectively to outsiders?
N-4
Can users energize/stimulate resource systems to work on their needs?
K-1
Does knowledge exist relevant to needs?
K-2
Is adequate search made of all existing sources?
K-3
Are resources adequately displayed?
K-4
Is relevant knowledge in a usable form?

The first step in Figure 31b is the convergence of various elements, mostly Rs but also Is, As and Cs, to form the nucleus or the plan for the project. The configuration, at least momentarily, is a completely positive one (I +, A +, and R +) within the project itself, and there is what could be called a 'surplus' of both I and R which is to be transferred to and used by the receiving country. The next step, 2, is to receive the authorization and acceptance of the project by the host country. At this point, the project can move in two directions, alternatively or simultaneously: either toward strengthening the infrastructure (3a) or toward substituting for lacking internal resources. An argument can be made for either approach and probably both are necessary, but the balance of our analysis in this chapter suggests that 3a is the more satisfactory route for the long run unless the project plans to become a permanent part of the host system. Either route, 3a or 3b, can be rationalized by the presumed following steps, 4a and 4b. In other words, a strengthened infrastructure will lead to a greater internal capacity to acquire and create resources (4a) and alternatively, the temporary infusion of needed resources, together with A + and C + will give the system time and strength to develop its own infrastructures.

INNOVATING USER SYSTEMS IN DIALOGUE WITH RESOURCE SYSTEMS

As noted several times, especially in chapter II, effective input of resources requires that the user (a) develop a satisfactory problem-solving configuration, and (b) enter into dialogue processes with various potentially useful resource systems. The various steps necessary to fulfil such a model completely are rarely seen in real life but an attempt at modelling them is provided in Figure 32. The innovator (on the right) and the resource system or source (on the left) are seen as the two parties to the dialogue. Between them pass two types of communication, one concerning *needs* (N-1, N-2, N-3, and N-4), and the other concerning various types of technical knowledge which is available for *dissemination*, (D-1, D-2, D-3, and D-4). In a true dialogue process we also assume the capacity for reverse flow of messages regarding either needs or knowledge (referred to in the figure as 'probes' and 'requests'). In addition there must be two important sets of processes going on inside the resource system and the user system, namely, *knowledge generation* (K-1, K-2, K-3, and K-4) and *utilization* (U-1, U-2, U-3, and U-4).

Figure 32 provides a check-list of 16 items against which the actuality of resource utilization in educational innovation projects can be compared. Without at this point going into an extensive elaboration on each step, we would like to suggest (a) the necessary interdependence of the steps as a procedural configuration for problem-solving, (b) the present inadequacy of most innovating systems in regard to each of these steps, and (c) the importance of moving toward a greater capacity to fulfil them. With regard to the last point, it may be desirable to reorient international efforts at innovation toward the improvement of linkages and of problem solving and away from either direct helping or innovating *per se*. Special attention might therefore be directed toward question D-3: is there a linkage system? We have noted the very promising beginning of the Asian Programme for Educational Innovation and Development; this is one approach toward the creation of linkage systems. The International Bureau of Education has also been making a special effort to establish a document-based world-wide information service for educational innovation (the International Educational Reporting Service, IERS). This also represents one effort in the same direction, but the task is an enormous one involving the creation of media, institutions and networks, the training and reorienting of the international expert network and the reconceptualization and replanning of the programmes of international agencies.

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CHAPTER SEVEN

Participation: how knowledge and action are organized, orchestrated and communicated within the system

Innovations are ultimately intended to benefit people, and since people are always organized into systems, innovations are also intended to benefit systems. Yet an innovation may not in itself constitute the benefit or may not provide the benefit directly; rather, it is supposed to be an 'improvement', a change in the way the system operates, so that benefits will sooner or later occur for the people in the system. Therefore, all the members of the system have an important stake in deciding upon the innovation and in determining what constitutes an 'improvement' for themselves. This will not always be an easy or obvious decision, since what may benefit one group or one subsystem may at the same time constitute more work or less benefit for another. Hence, the best innovations balance benefits and costs throughout the system to achieve the greatest benefits for the greatest number of members with the least associated costs and the fairest distribution of costs. There is rarely a way to be completely fair to everyone and to maximize benefits while at the same time spreading them evenly across all members. Hence, the *pattern of participation* among the members of a social system in the decision to adopt or develop an innovation is probably the most central issue in the process.

A second reason for treating participation as a crucial aspect relates less to the decision to adopt an innovation than to the actions which follow that decision, namely the implementation phase. Repeated analyses of the innovation process have shown that successful follow-through on the initial decision depends upon the involvement, knowledgeable action, and sustained motivation of numerous members of the system who may or may not be direct beneficiaries of the change. If, for example, teachers are ordered to set specific learning objectives for their students but are not told why or how this should be done and are not allowed to participate in the development of the necessary procedures, they will not understand either what to do or why it should be done. They will resist doing it and when they apply the rule they will do so poorly and inconsistently. The net result may completely confound the intentions of the original decision-making élite, leading to disruption and lowered efficiency of the learning process and anger and frustration in the teaching profession. Hence, participation is not only socially and morally desirable but functionally necessary.

A system *ideally* represents the collective actions of a set of people to fulfil their needs and to maintain or enhance their individual and collective sense of well-being. In spite of this collective ideal, however, we find over and over again that innovations are thought through and 'implemented' by small cliques or élites without involving in any way the people who are to be affected. Often the recipients of an innovation are not even *informed* of what will happen until after it has happened. Sometimes, of course, there are good reasons for limiting participation and these will be considered in this chapter. There are also important political and ideological differences between nations regarding what constitutes 'participation'. Resolving such issues is clearly beyond our scope. On the other hand, there are few if any societies in the modern world which would reject the collective ideal as broadly stated above; it should therefore be useful for readers from different types of political system to consider the generic issues of participation in innovation as they will be presented here. The main aim of the chapter will be to consider the various ways in which optimal participation can be achieved.

Although the necessity of participation is obvious, the realization of full participation is an extremely complicated issue, one which becomes more complicated as the system becomes larger and more differentiated. Therefore, it must be recognized at the outset of this discussion that participation by all in all aspects of developing, selecting, adapting, and implementing an innovation is an ideal which can never be achieved in reality. Whether it is viewed as a value in the goals toward which we strive or as a practical necessity, participation must be seen as a *relative concept*, with a dimension that varies from low to high in a degree that different members and groups of the social system interpret in diverse ways.

The chapter begins with an effort to understand the problem of participation in all its complexity. This takes up where chapter II left off in discussing participation as a primary throughput issue. Now we will propose a 'scale of participation' with different *levels*. We will also look at the different ways in which people can participate, consider the problem of vertical flow between leaders and followers, and the meaning of various communications media in the participation process. We will also look at the problem of participation from the point of view of various 'key actors' such as the innovators, the politicians, the educators, the practising teachers, and the ultimate consumers of the education system, the students themselves.

The second major section of this chapter looks at the various issues related to leadership and leader involvement in innovation. This is one topic on which the literature is not silent. References abound in the literature and in our own interviews, and the conclusions are consistent.

The third major section, which we call 'other actors', looks at the more sparse findings regarding participation by teachers, students, and the community in general.

The fourth section takes a special look at the role of the communications media in participation, reviewing several pieces of evidence from our survey. This analysis starts from the assumption that the most rudimentary form of participation and the basis for all other forms is *being made aware* that something exists or that something (e.g. the innovation) might happen.

The fifth and final section returns to the main theme presented throughout this book, the notion of a problem-solving dialogue. We suggest how would-be innovators and others might incorporate this dialogue principle in their planning efforts to move toward a more satisfactory pattern of participation.

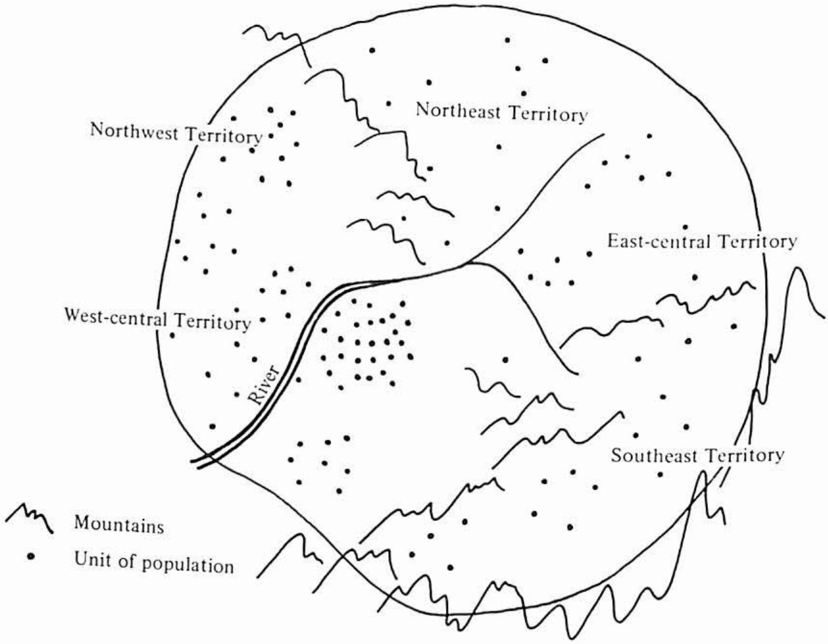
PARTICIPATION: DIMENSIONS OF THE PROBLEM

Chapter II proposed that there were several levels of 'system' beginning with the minimum level of 'relation' and leading on the 'connexion', 'cohesion', 'dynamic connexion' and 'dynamic cohesion'. Each of these levels suggests a type of participation. Ideally, of course, there are dynamic connexions and a dynamic cohesion among *all* members of the system but in reality such a state of affairs is both humanly and technically impossible.

Finding and fitting the geographical, social and economic configuration

Many of the issues of participation can be seen more clearly be resorting once more to diagrams and 'maps' of imaginary (and grossly simplified) social systems. Figure 33 depicts a small country which we will imagine to be very much underdeveloped and in which a technical assistance or 'innovation' project has been supported by an inter-

FIGURE 33. A small developing country: basic geography and population

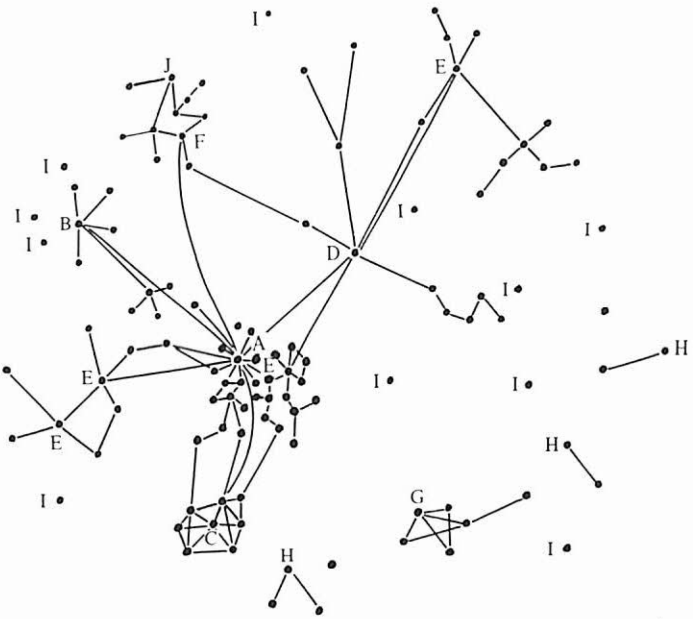


The figure illustrates only the *relation* level of system formation.

national development agency. Each dot on this figure could represent a person, a family, a village, or a population cluster of any magnitude. It may simplify the presentation, however, if we think of each dot as a person. First of all, it should be noted that only *relations* are shown, not connexions, cohesion, dynamic interconnexions or functional relations. Yet the figure does reveal a great deal about what will be the *likely* issues in participation when the country starts to innovate. We observe immediately that the country seems to have no natural geographic boundaries; on the contrary, it is divided by mountains which leave the southeast territory very isolated. Northeast is also relatively isolated by mountains as well as being being 'up-river', but at least it has some access to the more populated southwest via the river and a break in the mountains. West-central is not only the most populated area but also the area where people are closest together and where movement of people and resources can be facilitated by a wide navigable river; hence, connexions will form more rapidly and more bases for cohesion will be found earlier than in the other regions. There is also greater access to the outside world via the river.

Figure 34 shows the same country with the frequency of connexions between the population units. There is an obvious correspondence between population density and frequency of contact. We next note the occurrence of 'stars', i.e. individuals who seem to initiate or receive far more communication than others. The biggest star is A but B, C, D, E, and F also qualify. C is noteworthy because he belongs to a very closely-knit clique, whereas B is the sole connector for his cluster. D is noteworthy because of his very strategic role as linker of different population centres and especially of the up-river territories with the main population centre at A. There are no interpersonal connexions between the population centres at B and at F in spite of proximity and the absence of geographical barriers. Finally, the southeast

FIGURE 34. The informal social network in the host country



Lines represent visits, face-to-face contacts, and other direct transactions between units.

Units are drawn in exactly the same special configuration as the previous figure.

The figure illustrates one aspect of the connexion level of system development.

Lines represent visits, face-to-face contacts, and other direct transactions between the units. Units are drawn in exactly the same spacial configuration as in Figure 33.

The figure illustrates one aspect of the *connexion* level of system development.

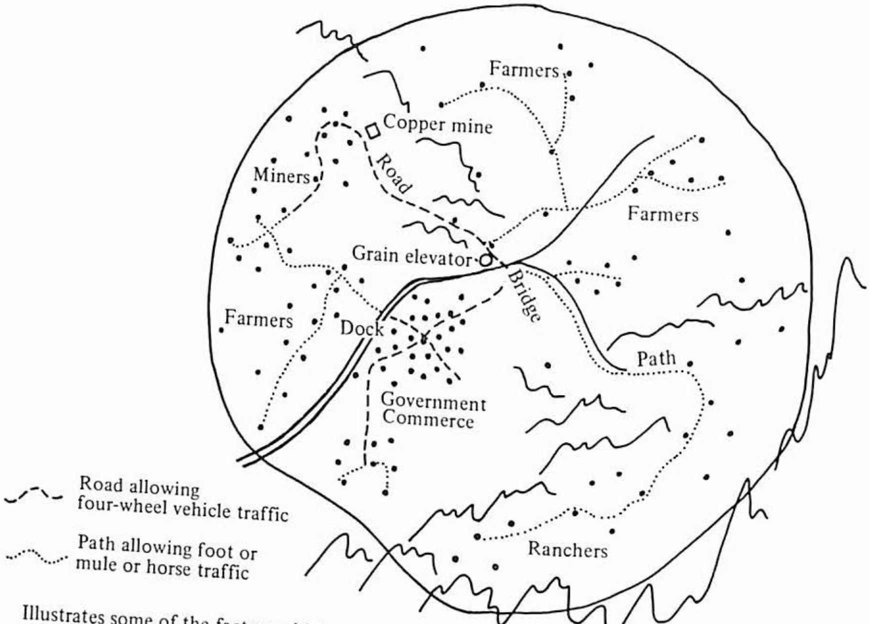
is not only completely shut off from contact with the rest of the country but is itself poorly interconnnected except for the cluster at G.

These informal network connexions, although imaginary, are typical of what is found when communities are studied closely by social scientists. The mapping of connexions is highly predictive of the patterns by which information and acceptance of new ideas spread. Often, information will enter at the periphery of a community, say at point J in Figure 34, but after it reaches F and then D and A it can spread very rapidly. Obviously, the more interconnected the society, the more rapidly new ideas can spread. This particular society will have a special problem in completely accepting new ideas because of the large number of isolates and isolated clusters (I and H).

Figure 35 adds more vital information relevant to patterns of probable innovation. The single road only connects two or three population clusters, the other centres being connected by paths which limit mechanized travel or transport. There appear to be two economic bases for development and foreign exchange, copper and probably farm produce, judging by the grain elevator at the head of navigable waters. We note that the population centre of west-central is also the port, the seat of government and the centre of commerce. These basic facts also suggest the types of social and technical differentiation necessary to sustain the economy, with the development of economic interest groups and internally cohesive subsystems which may come to be at odds with each other.

Figure 36 fills out this picture by adding elements of cultural and political origin as well as educational and economic differences. It appears that this country was

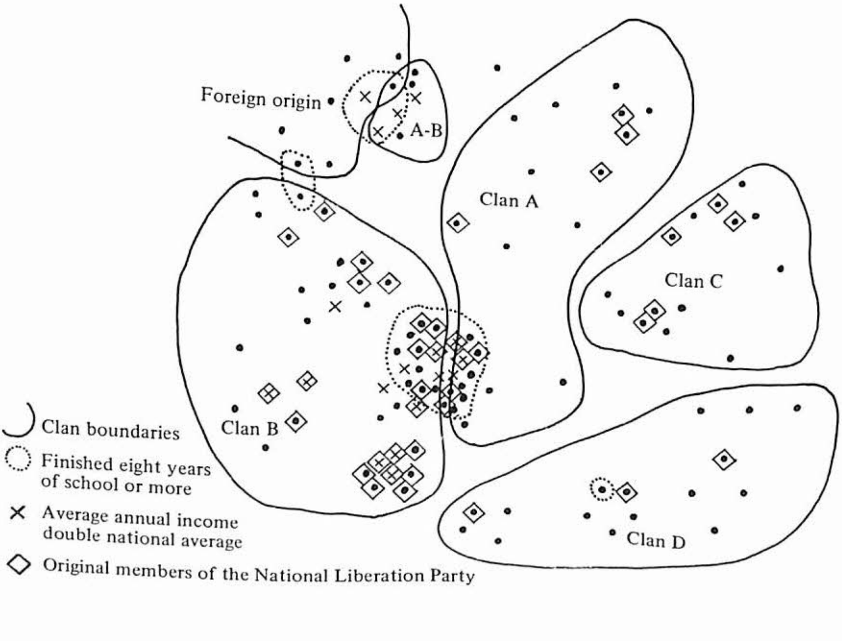
FIGURE 35. Economic base of the host country



Illustrates some of the factors which will lead to differentiation of the system and to connexions and cohesion among various clusters of population units.

Figure illustrates some of the factors which will lead to differentiation of the system and to connexions and cohesion among various clusters of population units.

FIGURE 36. Cohesive and divisive factors


Foreign origin
A-B
Clan A
Clan C
Clan B
Clan D
Clan boundaries
Finished eight years of school or more
Average annual income double national average
Original members of the National Liberation Party

formed by the coming together of clans A and B which have the largest populations and possess the most wealth and education. However, we see that the independence movement had adherents in all four clans and represents a strong national unifying element. The southwest clique appears to be an especially solid group of nationalists. Finally, we note the intrusion of foreign elements, presumably connected to the development of the mine although the primary economic beneficiaries of the mining activity appear to be nationals.

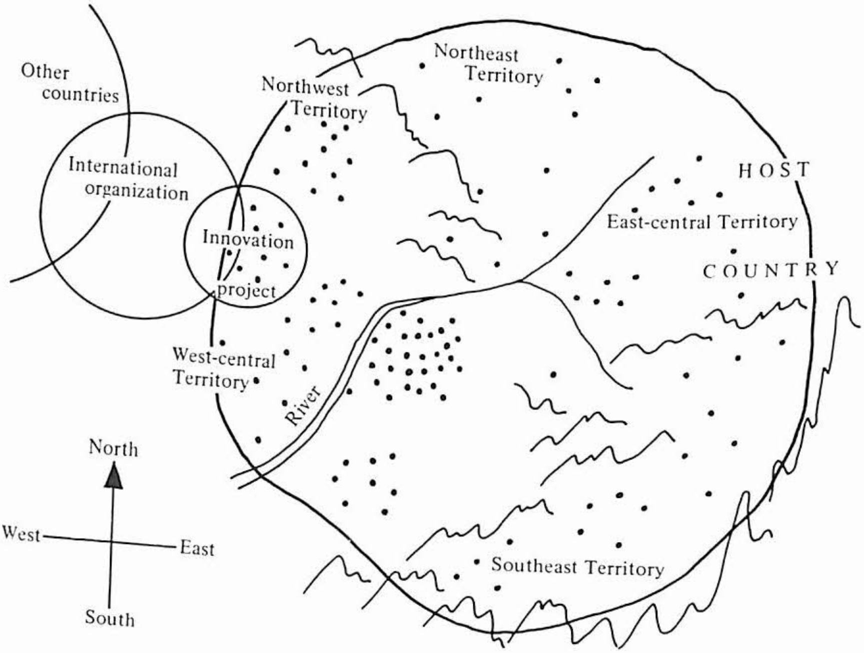
Figures 33 through 37 are obviously one figure and not five, a composite already complex but still far too simple. Still missing from this picture is any representation of the formal political structure of leaders and representatives, ministers and officials at countless levels. Also missing from the picture presented in Figure 34 are the many kinds of connexions which come about not through person-to-person interaction but through newspapers, radio, telephones, the distribution of pamphlets, public meetings, and so on. Each medium creates its own network of connexions; usually these networks are coincident with those already existing but sometimes they criss-cross the old networks and expand them greatly as radio does when it reaches out to non-literate audiences for the first time.

Now in Figure 37 we come to the central question for this chapter, what happens when an innovation project is introduced and how the host country can be said to 'participate' in this introduction and subsequent implementation and presumed diffusion throughout the country. Let us suppose that the government of this country has negotiated with an international assistance agency to introduce a functional literacy project which combines reading with learning about improved agricultural methods. The area agreed upon for the 'pilot' project happens to be in the northwest territory (circled area). From a look at Figure 35 there appear to be some sound reasons for this as a desirable location: it is farming country, the population is not too widely dispersed, and it is near the road-head and hence accessible to the grain elevator, the river, and to the population centres.

From Figure 36, however, the choice seems more questionable. It turns out that this is a mixed district in terms of heritage, three members having foreign origin and only two being identified with the national party. As expected, the area is poor and the educational level is not high. When we now return to Figure 34, the choice is even more questionable. Here we see that the area is poorly integrated socially with a high proportion of isolates and only one star (B). Furthermore, there are only tenuous connexions to other populations, all dependent on B and indirectly on A. The relative isolation of the cluster around B and B's centrality within the cluster will probably facilitate the pilot project as such, provided, of course, that B participates fully. However, when the pilot stage is over, there will be great problems in gaining nation-wide involvement and acceptance because of this isolation and because of the mixed and partly foreign origin of the population.

On the other hand, none of these social conditions need be viewed as immutable— the project itself may be planned and executed in such a way that it brings about a new alignment of interpersonal relations within the project area and even within the country. For example, the isolates in the area may be contacted and brought in to meetings. The various persons who become involved will then start relating to each other directly and not just through B. Hence the social configuration after a successful and participatory project might look more like C in the southwest and the key cohesive factor might be membership in the project itself. Furthermore, if the project included the building of a school or community centre, it might also be put to use to serve others in the surrounding ares; for example, a new road might be built directly to the river to bring in materials, and vehicles might be borrowed from the mining enterprise. All such activities change the social fabric ever so slightly, increasing connexions and providing more bases for cohesion. They are also likely to lead to a greater differentiation of roles and the opportunity for more complex and interdependent procedural configurations (problem-solving involving more persons working together).

FIGURE 37. The project in relation to the host country.



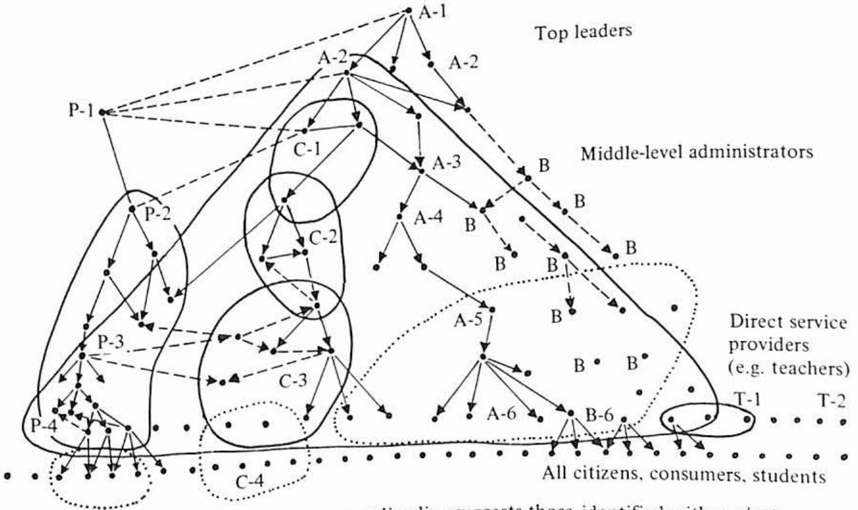
At the national level the project could also have various salutary effects which are not directly related to functional literacy as such. The first of these is the connexion of persons in the country with outside organizations and, directly or indirectly, with other countries for peaceful purposes. The project itself and its administrative and technical officials represent a new link between outside and inside and a potential channel of entry (and exit) for fresh ideas, resources, and people. To begin with, the project will require a decision by the country as a whole. In the process of making this decision, the designated leaders, such as the ministers of education or agriculture or the prime minister, may see fit to bring in representatives from each of the various clans, from the different farming and grazing areas, etc. They may wish to convene the party congress if the question is important enough. They may also want to establish an advisory or supervisory committee made up of representatives of the various clans or regions, a group which might also have the task of finding ways to spread the innovation to their own territories when the time is ripe. Again, all these meetings, committees, etc., have the potential of strengthening existing connexions and cohesive forces and of adding entirely new ones.

Hierarchies

Up to this point each of the population units in the mythical host country have been treated as if they were equals in power and command of resources, but obviously this is never the case. Regardless of the type of political system or the prevailing social or economic ideologies, all societies contain various types of hierarchies. For example, in the host country, in addition to the national governance structure with ministries and so forth, there will be a bureaucratic structure of some sort to manage the copper mine and perhaps another to manage the grain elevator and the dock facility. The larger and more differentiated the country, the taller and more intricate these hierarchies are likely to be. To some extent they will follow or reflect the informal communication patterns suggested in Figure 34 but they will not necessarily be equivalent, and the planners of innovations need to be fully aware of and adept at using both. Figure 38 is an attempt to display some of the issues connected with the understanding and use of hierarchies.

First of all, it should be possible to depict most hierarchies as some sort of pyramid, for this is in theory the way hierarchies function: any system can be represented more or less adequately by a series of succeeding layers, starting at the top. Hence, any outsider who wishes to make contact with the 'system' as a whole can then do so by making contact with the top person or his designated representative. In practice, however, hierarchies usually do not work so simply, particularly in developing countries. To begin with, as Figure 38 is intended to show, the effectiveness of a hierarchy is largely dependent on the degree of connectedness and cohesion between levels and among functionaries at each level.

FIGURE 38. Connexions and cohesion in a hierarchy.


A-1
Top leaders
A-2
A-2
P-1
C-1
A-3
B
Middle-level administrators
P-2
A-4
B
B
C-2
B
B
B
B
Direct service providers (e.g. teachers)
P-3
A-5
C-3
B
B
T-1
T-2
P-4
A-6
B-6
C-4
All citizens, consumers, students

P-1-2-3-4.	Levels of the project; surrounding line suggests those identified with project.
P-1	High-level outsider who authorizes project and has connexions internally at the highest level.
A-1	Might be the president or prime-minister.
C-1-2-3-4	. Might represent the Ministry of Education.
——	Strong lines of influence
– – – –	Weak lines of influence
◯	Cohesive membership group
⬭	Loose membership group

It is impossible here to enter into a long discussion of how hierarchies function, but a few points must be noted. First, a major function of hierarchies is *to substitute for participation* in one or another aspect of the workings of a society. This substitution takes place for a variety of reasons both practical and ideological, e.g., too many people, hence the need for representation by either elective or symbolic means; sense that the people are not 'mature' enough for self-governance; belief that the tasks to be performed require specific skills or experience (technocracy); belief that people should be given power and status in proportion to some attribute such as wealth, intelligence, age, sex, race, loyalty to the regime, ideological purity, etc. Second, hierarchies vary greatly in strength and stability, and within one hierarchy there may be several sub-hierarchies which so vary (as suggested in Figure 38). Third, hierarchies which are connected but not cohesive are likely to distort communication between levels, particularly tending to suppress the flow of negative information upward. Fourth, formal hierarchies only partially correspond to social influence structures (see Figure 34), i.e. some designated 'leaders' have much more influence to change the opinions of their followers and peers than do other 'leaders'. Also some persons low in a hierarchy may be 'gatekeepers' who can block or allow access to vital information, resources, or key power figures.

We can imagine that Figure 38 is just another way of picturing the mythical country which has been described in Figures 33 to 37. A-1 could be the president and could also be the A in Figure 34. Therefore he leads formally and informally, and he sits on top of several hierarchies which are internally rather different from one another . The 'A' hierarchy is the most formalistic and directive in a top-down sense; perhaps this is the army. The 'B' hierarchy on the other hand seems much less formalized; perhaps this is the party machinery, or vestiges of the old clan system. The 'C' hierarchy contrasts with the others by being both highly structured and at the same time fairly cohesive across levels so that each cohesive cluster contains members who have dual membership with the cluster above or the cluster below. This is the type of overlapping group structure which has been frequently proposed in recent years as the ideal type of structure for correcting the faults of traditional bureaucracies. Perhaps we can imagine that the education or the agriculture ministry of our host country has managed to develop such a structure.

Into this web of overlapping hierarchies we now introduce the innovation project ('P') which is also a hierarchy from its very inception. P-1 is the official of the international agency who happens to meet C-1, the minister of education, at an international conference. They discuss the possibility of a project which is then discussed and cleared with A-2 and A-1. P-1 has both high status and outside status and is therefore free to deal directly with the highest levels of the host country to 'clear' the project. However, P-1 is too high and too busy with many other things to be directly concerned with this project on a day-to-day basis, so this becomes the task of P-2 who might be the 'chief technical adviser', and, *de facto*, the chieftain of the emerging hierarchy of the project itself. At each succeeding level the project must strike some sort of balance between internal connexion and cohesion and external connexions.

Finally, at the lowest level of the pyramid we find the practitioners and consumers of the system which the entire set of hierarchies is supposed to serve. Ironically, however, it is at the lowest levels that the connexions are the most tenuous and the sense of cohesion the weakest. Indeed many types of practitioners, such as teachers, may form themselves into 'unions' or cliques for the very purpose of self-protection and resistance to the influence of the upper levels of the hierarchy.

Levels of participation and ways in which people can 'participate'

The word 'participation' may conjure up images of people sitting around a table, discussing, arguing, and then voting on whatever there is to decide. We would prefer to use a much broader concept which includes such activities but starts at a more rudimentary level that may be called 'awareness'. Simply to know that something exists represents some kind of connexion to it, the possibility that one could become more informed and more connected and the possibility that one could direct others toward it. In other words, 'awareness' can be a kind of gateway to higher levels of participation and without 'awareness' there can be no participation.

The next level we might call 'being informed' at which point a person could say something about the goals of the project or its leadership, sponsorship, location, and connexion to various other hierarchies and system elements and actors. Obviously, there is a great range of possible levels of being informed, the minimum constituting little more than awareness and the maximum only attainable by those who are fully part of the project and participating in all other ways.

A third level might be described as 'representational consent'. At this level, the participants have some voice in the selection of those who will be more directly involved, either by election or veto power or some other means of choosing. This can be a very perfunctory *pro forma* process or only a symbolic act. The more seriously the selection process is taken and the more involvement by the people in the selection process, the more they are likely to *feel* that they are participating at subsequent stages, because they will see their representatives as 'one of us' and 'truly representing our interests and values'.

The fourth level might be called 'direct consent'. Here the people actually decide by vote or equivalent process whether the project shall be undertaken, whether it should be continued and at what level of funding, etc. As the number of people involved at this level rises, the process becomes more formalistic until it reaches the point of 'referendum', or 'plebicite'.

The fifth level could be called 'vicarious participation', meaning that the person in question feels as if he or she is completely party to all key decisions because he is fully identified with one or more of the decision makers, in full agreement with their decisions and fully informed on a regular basis of what those decisions are and what thought processes contributed to them. Typically, only those who are within the hierarchy of the project itself can attain this level. Ideally, leaders, such as P-1 or C-1 in Figure 38 are also at this level, provided that their appointees to the operational management of the project continue to be in regular contact with them.

The sixth and highest level might be called 'full participation', i.e. complete membership in all groups making decisions for the project. Only the director and his closest associates and deputies are likely to achieve this level although it may be an ideal for a much wider circle.

In addition to these 'levels' we need to consider the phases or aspects of a project in which people are allowed to participate. It is often seen as adequate to make the majority of people only dimly aware of many facets of a project, especially when it is still in the planning phase, to involve many directly and others by representational consent in the actual decision to 'adopt' the innovation, but then only to inform very selectively during the implementation phase...

Who participates: key actors

Most innovation projects require the participation of a diverse set of actors: specialists of various sorts, managers, decision makers, publicists, editors, writers, evaluators. Yet from the point of view of participation only a few aspects of these people are of primary concern. Perhaps the most important is whether they are seen as 'outsiders' or 'insiders'. There are distinct advantages to both outside and inside status in innovation teams (which have been identified by Havelock, 1973), but in summary one general principle can be stated: it is advisable or desirable for a project to include both insiders and outsiders working in close collaboration in key roles. Such a pattern would characterize many of the teacher training projects in our survey.

Whether they be insiders or outsiders, it is likely that any innovation project will include one or perhaps two people who could be labelled as the 'innovators', i.e. persons who were primarily responsible either for the creation of the innovation or for its introduction to this particular setting. Very often these people will be rather different from the other people in the host country, even if they are nationals. First of all, they are likely to have travelled widely in other countries and to have read rather widely as well. They may be somewhat marginal to the centres of informal influence (as suggested in Figure 34) but, if they are effective they will have excellent contacts with others who are influential. The innovator, in effect, ought to be and often is a *linker* who ties together the influence and expertise networks within the country or between countries.

To be effective, innovators must relate to 'leaders' of various types at various levels of the host system. Most obviously there are the political leaders. An innovation project of significant size in a developing country probably requires some sort of participation by the president or the prime minister, who must be informed and must approve. Beyond this, however, it takes shrewd political judgement on the part of the innovators to estimate just which political leaders are important for a project and which are not. Sometimes it is even desirable to locate people who might become vocal critics of the project at a later date. Finding these resisters and allowing them some level of participation early may neutralize their negative impact at a later date; such persons may also provide important information regarding problems of acceptability of the innovation itself. Above all, the type of 'leader', who must be identified and brought into active participation, is the 'informal influential' in the various key subsystems which will have to accept, develop and maintain the innovation. These are the people represented as the 'stars' of Figure 34.

In addition to these various types of leaders, a project needs to involve the various actors who represent the main stream of the existing educational 'establishment' from top to bottom. This starts with the ministry but also will have to include administrative officials at various levels down to and including school headmasters and, of course, teachers and their representatives. Innovators will tend to be most ambivalent about involving such 'establishments', especially if they feel they have innovations which are antithetical to prevailing establishment philosophy. Nevertheless, innovations must be institutionalized and must be integrated somehow into existing structures and processes if they are to have lasting impact. This means dealing at some level with the powers that be and not completely by-passing them.

To summarize this section, the complexity of issues related to participation can now be appreciated. First, we need to be able to envisage the social setting in terms of geography, i.e. natural boundaries, barriers, access routes and population distributions. Second we need to understand the informal and formal connexions between people, especially to locate the 'stars', the 'gatekeepers', and the 'linkers'. Third, we need to understand the various economic and social divisions and how these interact with the social networks. We also need to be able to envisage the host setting as a hierarchical pyramid or perhaps a set of overlapping and interrelated pyramids. We then have to think strategically about which layers of which pyramids must be involved in the project. This 'involvement' can take many forms, ranging from 'being aware that the project exists' to 'full participation in every aspect of decision making at every phase'. It is clearly impossible to plan a strategy for participation which adequately takes account of all these factors. Trade-offs need to be made based on the *relative* importance of this or that group, this or that region or economic sector, this or that leader, and so on. We get some inkling of how these trade-offs are made in the developing countries today by looking at our literature sources and by analysing some of the responses to our survey. Therefore we will turn now to these data sources.

LEADERSHIP

Political leadership

Almost everyone who reports on educational innovations stresses the importance of involvement by the top political leadership of the host country. Starting with the *very* top, here are a few examples. Schramm summarizes experience in several countries with educational television projects:

> None of these projects could have come into existence, and none of them could have continued for very long, without strong support from the top. In Samoa it was the vigorous backing of Governor Lee; in El Salvador, the strong support of Minister Beneke; in the Ivory Coast, the support of President Houphoët-Boigny. In Niger, President Diori's interest made possible the existence of the project, and the fact that almost no other strong support existed in the government made it difficult for the project to expand beyond the experimental stage. (1)

Lallez, in his study of the IPAR project in Cameroon, notes 'the keen interest right from the beginning' on the part of the president. When the president showed this kind of interest, then all cabinet members and other high ranking officials showed interest. The president participated by keeping close watch, mentioning the project in important speeches, and by actually handing out diplomas at the first graduation ceremony.

The top leader may be little involved in specifics but may set national goals in such a way that all other efforts on more specific projects are energized. For example:

> The plan to launch a major campaign for members was developed after President Nyerere declared 1970 as "Adult Education Year" and asked all educational and political organizations in Tanzania to undertake mass education campaigns for adults during that year. (2)

The consequences when participation by political leadership is not present or is only lukewarm are well illustrated in Grabe's case study of the non-formal rural education project in Upper Volta:

> . . . it may safely be said that the REC does not enjoy unequivocal support of the government. The objectives and rationale of the program, which was originally conceived in colonial days mostly by expatriates, have always been the subject of debate and the program still remains officially labelled "experimental" even after more than ten years of existence.

and further:

> . . . scarcity of essential supplies, such as books and paper, also persists. It was not part of the REC plan that these scarcities could or would be met by the poverty-stricken rural communities of Upper Volta. However, failure in meeting such scarcities is probably another indication of lukewarm government enthusiasm for the program. (3)

Our survey data confirm the fact that political participation is seen as very relevant. The need for change was felt 'strongly' or 'very strongly' by political leaders in 87 per cent of the projects reporting, and the need was judged to be 'clearly' or 'very clearly' understood by political leaders according to 70 per cent of our respondents. Political speeches were used *frequently* to express the need according to 44 per cent of the respondents and were used at least once according to 85 per cent.

Educational leadership

It is probably important to make a distinction between political and educational leaders; the latter are, of course, lower on the power dimension, but they have much more at stake. If the project goes awry, they are more likely to be blamed. If the project requires more resources, they are most likely to be the ones who will have to provide them. If the project upsets the *status quo*, it is *their* status which will be most upset. In many cases, the innovators may be ambivalent or openly hostile towards certain elements in the 'educational establishment', seeing this group as the primary obstacle to change. Whether or not this occurs, it seems evident that the educational establishment, if so included, has almost limitless power to obstruct, delay, distort, sidetrack, and undermine the efforts of innovators. Therefore it is essential to find ways of involving the existing educational leadership in innovation efforts. Documentation of these points is plentiful, and we will cite but a few examples.

Schramm attempts to explain why the highly praised Niger project for instructional television did not expand beyond the original pilot project:

> . . . much of it was due to the passive resistance of the educational establishment. And this in turn resulted in no small part from the fact we have noted: that the project was imported, was operated for the most separately from the Ministry, and rejected the trained Niger teachers in favour of untrained monitors and the traditional colonial curriculum in favour of a new and different curriculum. In other words, apparently little was done to integrate the project into Niger's plans and capabilities for carrying it on. It had few supporters in the Ministry, and was largely ignored by the officials responsible for the future of education in the country. (4)

Lallez observes that in the IPAR project in Cameroon the school inspectorate was seen from the start as a major obstacle. Therefore, early drafts of the proposal were couched in vague terms so that this important interest group would not be aroused. Inspectors were also kept in the dark concerning progress on the project and hence their 'effective collaboration' was impeded. As a result, inspectors later became a prime source of resistance.

Sometimes, of course, innovation projects are ignored by educational officials simply because of the sheer load of their routine work and the amounts of paper with which they are burdened. Owiredu makes this point as follows:

> Lastly, it is the experience of the African Social Studies Programme that unless the top people in the educational systems of member countries are properly informed of the basic philosophy and methodology of the Programme, progress is slow owing to lack of adequate support from above. Due to extreme pressure of work, people at the top of the educational system usually find it difficult to read and absorb the many documents sent to them. Periodic personal contact and discussion with Chief Education Officers/Chief Inspectors of Schools and even with Ministers of Education in the member countries by the Executive Secretary is considered not only beneficial but also essential. (5)

Many of the best documented examples illustrating the importance of involvement of educational leaders come from studies in the United States. For instance, Greenwood et al. make several pertinent observations from their detailed case studies of local educational projects supported by funds from the federal government. They make the following summary observation which supports what is reported from all over the world:

> An innovative project is both a challenge to the status quo and a complex technical undertaking. Thus it often faces many political and administrative roadblocks. In the projects we visited, it was apparent that unless those responsible for project support – usually the district staff – expressed clear interest and commitment to the goals of the project, each obstacle tended to compromise the project's basic concept more and more, and to erode whatever initial staff enthusiasm existed.

The Greenwood team is able to back up this generalization with several explicit examples, e.g.:

> In the sites we visited, the extent of support for a change agent project at all levels of the district – from the central administration to the school principal – influenced the course of project implementation. Support and commitment to the project at the district level often seemed to be vital in pulling a project through the rough first year.
>
> For example, when the Eastown open-classroom project almost collapsed because teachers threatened mutiny in response to heavy-handed practices of the project director, intervention by the director of elementary education was able to smooth ruffled feathers and retain teacher (and project school) participation in the project. Similarly, in Centerville, resistance to team-teaching/open-classroom concepts or inability to deal with the resulting problems on the part of principals was dealt with first by clear guidance and direction from the superintendent, backing up the project director, and then by changes in personnel.
>
> Likewise, the Brickton Right-To-Read project had strong backing from the superintendent, and the staff said that without this support, "We would never have made it in the beginning".

Of all the people in the administrative hierarchy, the school principal or headmaster is probably the most crucial for actual implementation and maintenance of a project after the adoption decision has been made. Greenwood et al. again make the point very well with examples:

> School principals' attitudes had even more dramatic and immediate import for project implementation – particularly where participating staff had a dual allegiance to the project and to the school. One of the Sandwood project classrooms was located in a school headed by an ex-military officer who believed that discipline and order in the classroom were essential and did not support the "child-centred" strategies advanced by the project. Consequently, the project teacher's classroom was moved to the room directly across from the principal's office, and the principal's visits and complaints about "noise and chaos" were frequent. And, not coincidentally, as the second year of project operation began, this project teacher found that most of the school's "problem" children had been reassigned to her classroom.
>
> Supportive principals in this project provided quite a different atmosphere, going to great lengths to provide extra services for classroom teachers, to make schedule changes that would accommodate project requirements, and to encourage other teachers in the school to view the project classroom as a "model" for their own practices. The result was increased professional pride and esteem for the project teacher and the slow spread of project practices to nonproject classrooms throughout the school. (6)

Finally, we can turn to Armsey et al. for a flurry of world-circling examples to cap this discussion.

> Leadership must be exerted at the right level of authority, responsibility and control. Strong backing by top authorities is the basic requirement for effecting swift innovation in a school system. Hagerstown had strong leadership from the superintendent of schools and support from the Board of Education. Chicago's Television College had support from the top. Television teaching in American Samoa got under way because the governor sponsored it. El Salvador's television project was supported unreservedly by the Minister of Education. In Israel, the Minister of Education supplied the political support, backed the director general, lobbied for the money, and made the project work. (7)

Data from our survey of teacher training projects confirm the importance assigned to educational leaders in the literature. Educational leaders 'participated actively in all main phases' of the project, according to 52 per cent of our respondents. This compares to only 14 per cent for political leaders, 14 per cent for teachers, and 12 per cent for community members in response to the same question. Educational leaders were involved in 'key decisions' according to 59 per cent of respondents, political leaders 48 per cent, teacher representatives 12 per cent and community representatives 12 per cent. Education leaders were also cited as feeling the need for change 'very strongly' (62 per cent *vs* 46 per cent of political leaders, 30 per cent of teachers, and only 46 per cent project team members) and 'very clearly' defining and understanding the need (53 per cent *vs* 32 per cent of political leaders and 23 per cent of teachers).

Informal, local, and community leadership

Reference once again to Figure 34 is a reminder that real leadership often resides not in the political or educational hierarchies but in the informal network of connexions which ties a community together and makes a system a system. The utilization of informal and local influentials is probably most vital in the development of programmes of non-formal education or functional literacy where adult members of the community are an integral part of the programme and essential to its success. Thus in the United Republic of Tanzania we find some of the most strenuous efforts to involve such indigenous leadership and, in fact, to build a leadership structure where none had existed before.

Other examples are frequently found in the area of family planning and agricultural extension, and justify consideration by educational innovators. Colletta, for instance, makes the following observation:

> While these informal and traditional avenues of leadership are not always officially recognized by the Government, they are deeply rooted in the indigenous culture and gain their authority and legitimacy through such factors as heredity, seniority, and tradition. As Soemardjan (1963) remarked in an analysis of community development efforts which built on traditional feudal government in Banjumas, Central Java:
>
> 'It is perhaps this loyal attitude towards recognized indigenous leaders which for the most part accounts for the success of community development in this area. . . rapidly succeeding social changes have caused only a minimum of social disorganization, and have done little harm to the relationships between the members of the communities and its ruling élites.'
>
> Indigenous leadership has been successfully utilized in the Indonesian development process as exemplified by the use of *Dukuns* (mid-wives) in the National Family Planning Program (Muncie, 1972) and the employment of *clan religious* leaders in implementing the *Bimas*, mass guidance in rice cultivation program in West Sumatra (Esmara, 1971).
>
> Those community leaders who are not clearly identifiable may be discovered by using techniques that identify points of community influence and power. It is a short step from the identification of such leadership to the establishment of communication between government development agents and indigenous leadership to begin to work together to solve community problems (Emerson, 1974). (8)

Brumberg attributes some of the success of the ACPO multimedia rural education project in Colombia to its ability to tap into and make effective uses of local influentials:

> A mass education program must gain the support and approval of the local power structure if it is to be effective within given communities. In Colombia, the local priest figures very prominently in this power structure; in other countries a similar power position may be held by a local chief or mayor, and he too would have to be won over to the objectives of the educational program. ACPO (even as it seeks to reduce reliance on the priesthood) has sought to involve the local priest in the programs, has held special courses for them, and has attempted to present their role as complementary to, rather than in conflict with, that of the priest. (9)

From the Indonesian Jombang Youth Project case study we find another very deliberate effort in this direction:

> A number of people regarded as 'opinion leaders' were briefed on government actions, programs, and policies with the expectation that the information would spread through them to others in the community. (10)

Similarly in the Thailand functional literacy project:

> In the beginning, the program encountered difficulties in trying to convince adult illiterates to enrol, particularly those who had no occupational need for formal credits. Many associated the new functional classes with the rigid traditional literacy and primary classes; some felt they did not need literacy; and still others felt they were too old. However, community leaders, such as village headmen, monks and respected villagers, helped the educational officers to convince potential students of the differences between functional literacy and literacy programs in the past. (11)

The significance of local leadership as a vital connecting link between parents and teachers has been documented by Evans:

> Teachers who are, generally, high on contact with families are, also, high on contact with local officials. In fact, from the author's experience, the parents most often seen by the teachers were those who had some responsibility or position in the local community. Sometimes, these leaders serve as unofficial representatives of less well-educated parents, who are reluctant to speak directly with the teachers. (12)

Our survey data suggest that Unesco-UNDP assisted teacher training projects make relatively little deliberate use of opinion leaders and informal influentials. We asked respondents to rate the relative emphasis placed on various possible strategies (to be reported more fully in chapter IX). One of these items was 'identification and use of formal and informal leaders of opinion'. Only 7 per cent said there was extreme emphasis on this strategy while another 33 per cent said there was 'high' emphasis. The rest reported only moderate or little emphasis. Compared to most of the other 29 items on this strategy list, this item ranked rather low. It is our feeling that educational innovators are still rather naïve about local informal power structures and underrate their importance in the introduction and especially in the maintenance of innovations over a period of time.

THE OTHER ACTORS

Successful innovation does not depend on leadership alone. There are many people at all levels who must contribute and who must therefore participate in some way. In particular, attention should be paid to the involvement of teachers, students and the members of the community as a whole, including parents.

Teachers

Teacher support seems to be very important at the implementation and later phases of a project. However, the need for teacher participation may be ignored at early stages of decision making when there are no teachers around. Here are three examples from Schramm which are illustrative:

> Each of these projects encountered strong resistance at some time in its development. The principle seems to be that change of such magnitude always creates a delicate situation and rouses defenses. In Niger, the opposition came from the educational establishment – the Ministry whose curriculum and methods were rejected and who did not have conrol over the new classes, the Teachers Union whose members were rejected in favour of untrained monitors. In Samoa, the first opposition came from members of the Department of Education who did not believe in teaching by television; this was overcome by Governor Lee's determination to change the system quickly.

> Later there was political opposition, apparently using the schools as a device to strike at territorial officials. Still later, the secondary school teachers, feeling more confident, became dissatisfied with having to share so much of the teaching with the television teacher. In El Salvador, the chief opposition came from the Teachers Union, which was dissatisfied with salaries, and struck at television mainly because they felt the money it cost should have gone into higher pay for classroom teachers. (13)

The sequence of events in the Samoan case is particularly instructive. Armsey furnishes further information on the teachers' situation and the reason for their concern:

> Teachers must participate and support the project (unless they are to be diplaced altogether, a prospect thus far unlikely in any country in which they have a stronghold). Lyle Nelson of Stanford, who has observed and evaluated the American Samoan effort from its beginning, discussed the tendency not to involve the teacher in instructional technology:
> '. . . the operation essentially began with the decision to use television following which came questions about the role it should play. Obviously this is going about things backward. The much more sensible approach – which everyone endorses but no one seems to follow – would be to define educational objectives and specific classroom objectives with the classroom teachers involved, and then to ask what part in meeting these television might play. . .
> Instead of starting with educational needs and objectives and then asking what part instructional television might play in meeting them, what was done in Samoa was essentially to design a new curriculum for television. As a result, the role of the classroom teacher was downgraded, very much so, with predictable results. The classroom teacher – by far the most important factor in any learning process – became at best an ancillary element and at worst an unwilling and negative participant. It is significant, I think, than in the early stages the project was in the hands of broadcasters and not curriculum specialists.' (14)

These points are strongly underlined by the more detailed and numerous examples of innovation in the United States. Again, Greenwood et al. provide some excellent case material:

> In the projects we visited, we found that no matter how good the quality of the treatment finally proposed, the project plan was likely to underestimate the problem of winning staff acceptance. For example, in Eastplace, the project director spent two years developing career education materials before they were implemented in the classroom. The project involved a complex conceptual framework utilizing sixteen behavioral outcomes, hundreds of content-specific behavioral objectives, and more than forty curriculum modules keyed to the objectives. Although teachers were utilized in developing the modules and objectives, the over-all design was the project leader's own. One year after implementation, the level of classroom utilization appeared to be quite low, and few of the teachers seemed to follow the project design in using the materials.
>
> In Centerville, however, a committee of teachers was formed to work with the project leader in developing the project plan. Individual teachers accepted responsibility for different elements of the plan. As a result, the project was tailored to each school, and the staff felt a strong sense of participation and commitment to the project.
>
> Implementation seems to be easier if those responsible for developing the project work closely with the staff members who must eventually implement the project. We found that this early involvement led to an important sense of 'belonging', to a belief on the part of implementers that project objectives were important to them and to the target group. This also suggests that communication skills are an extremely important qualification for the project leader – much more so than substantive skills. (15)

Our survey data assume special significance when we approach the topic of teacher participation because our sample consisted of teacher training projects. Therefore, this may be the best point at which to introduce some comparative data. Table 7.1 indicates that in almost half the projects teachers understood the need only dimly at best, less in any case than political leaders who presumably would have far less involvement. Turning now to Table 7.2 we find that teachers were rated as having 'little involvement' more frequently than any other group and that such involvement as they have tends to be more at the operational than at the decision-making level.

TABLE 7.1. Who understands the need?

Question: 'Was the need clearly defined and understood by . . . ?'

	Very clearly %	Clearly %	Not very clearly %	Not at all clearly %	Total %
Project team	65	25	10	0	100
Political leaders	32	38	23	7	100
Educational leaders	53	27	19	1	100
Teachers	23	32	37	8	100
Trainees	16	33	39	12	100

TABLE 7.2. Who participates at what level?

Level of participation	Political leaders % *	Educational leaders % *	Teachers % *	Community members % *
Participated actively in all major phases of the project	14	52	14	12
Made or participated in key decisions	48	59	12	12
Were represented on project working teams	22	40	37	70
Were represented on advisory groups	16	38	21	**
Made speeches in support of the project	40	***	***	***
Involved but in other ways	4	0	6	21
Had little involvement in the project	22	6	37	4

* Column totals add to more than 100% because respondents were allowed to check more than one alternative.

** This item inadvertently omitted in questionnaire.

*** This alternative was not given in questionnaire.

From the various quotations provided in this section, it would appear obvious that teacher participation is necessary for successful innovation. Yet the data from the most recent Unesco projects suggest that this important interest group is often being ignored when key decisions are made.

Students

The literature appears to be appallingly silent on the question of student participation in innovation. It will be noted in Table 7.1 that the need is least clearly perceived by the 'trainees' (i.e. student teachers). As part of the question on which Table 7.2 is based we also asked whether other persons or groups were involved in a significant way. While 21 per cent indicated that there were other groups, students as such were rarely mentioned.

Part of the problem here may be with the type of innovation which is reported and which comes to the attention of such bodies as ministries of education or international development agencies. It seems reasonable to suppose that there are countless changes within the classroom and within the school in which students play a major role; but there seem to be no satisfactory means to publicize, generalize and diffuse these innovations so that they come to the attention of others within and outside the region in which they are generated.

The possible exception is the Barrio high school movement in the Philippines which is reported on by Orata, one of its prime movers. Indeed, the Barrio model has many elements of both community and student participation. Here is but a brief example in which Orata discusses a road building project:

> The schoolchildren were asked if they were willing to help in the construction of the road according to their physical ability to do so. Even third-grade pupils could carry half a pound or kilo of earth to place on the road-bed, and nearly 400 pupils could do a great deal if they did nothing but this. The point is that we wanted them to have a part in the making of the road so that they will later appreciate and take good care of it, and not do anything to damage it. Of course every little thing would help, and one or two hours a week in lieu of physical education at an appropriate hour—when it is not too hot—would not be detrimental to their health, and it would certainly add to their moral character. This turned out to be a good thing to do, following the example of Indian schools.

Community

Part of the problem cited above may lie in the possibility that in developing countries less of a distinction is drawn between the student and the community as a whole. Particularly in nonformal and functional literacy projects the distinction is necessarily blurred since the primary objective is not to segregate and 'educate' specific age cohorts but to provide the kinds of services which will allow a community to develop in several directions. It is interesting to note, therefore, that in Table 7.2, 70 per cent of our respondents reported involvement of community representatives in working terms (i.e. at the operational level).

What happens when the community is *not* involved is perhaps best exemplified in Grabe's case study of the Rural Education Centre in Upper Volta:

> Observers who have visited a large number of centres and the counsellors of rural education are unanimous in their comments on the quality of the soil: too many villages have given the worst possible fields to the rural education centre, a dubious benefit that probably explains the mediocre harvests recorded at many of them.
>
> Normally the centres are built on the fields allocated to them well outside the village. . . . Parents of rural youths and the youths themselves, of course, clearly saw what was happening and regarded the REC, at best, as a temporary expedient that should be replaced by the real thing, the primary school, and at worst, a symbol of discrimination against the rural people. In fact, as the IEDES investigation has revealed, parents continued to hope that the REC would be converted to a regular primary school and tried to send primary school age children to the REC. But when after a three-year cycle the REC was not converted into a primary school, the villagers' hopes were shattered and new REC recruitment efforts faced increasing resistance from the villagers. . . . The lesson of the Upper Volta experience is that a rural education program cannot be effective as long as it stands as a symbol of discrimination and fails to get the acceptance of the rural people. (17)

The reverse side of this coin is what happens when community participation is maximized. Here again we can turn to Orata's account:

> Again, the procedure was not all that it might seem, namely to talk people into agreeing to give us the right of way. Following are some of the steps that were taken.
>
> 1. All zone chiefs (six altogether) agreed on the proposal forwarded in our first conference just after my arrival. The matter of road building and its importance to the people and to the pupils themselves was the subject of discussion in the different classes in the Bactad school. This was to get the pupils to influence their parents to help in the construction of the road.
>
> 2. We had a meeting with the people of Sogcong, Portugal and Timbogan one evening at which we told them that we would be willing to work for the construction of the road provided that they would agree not only to build it, but also to install in their yards the following, which most of them did not have: sanitary latrines, dry *pagbabasaan*, compost pits, and pigpens. We reasoned out that the purpose of the road was to enable them to market their products, to improve standards of living, to enable doctors and nurses to visit them when they get sick, and to make it easier for the children to go to school. But unless they also helped themselves by putting their pigs in pigpens, providing sanitary facilities, conserving waste for fertilizers, and seeing that the children did not get sick often, the road would be of little help to them. This was our chance to explain the value of the health and security measures that were uppermost in our minds in order to help them most, and we decided to match the privileges that they asked for with the corresponding responsibilities which we believed it was to their own interest to accept and do something about. They agreed after a long discussion, and a date was set aside to visit them in order to check what they did to implement their promise. The visit was made, and even though the result was far from 100 per cent successful, the committee was satisfied that they had made a significant effort to carry out their agreement. We suggested that they continue improving, and we saw that they were in earnest. (18)

The reader might infer from such an account that inspired local leadership by Orata or someone else might also have been necessary to bring this off. In fact, a key attribute of effective leadership must be to inspire involvement by the people as a whole in the implementation of innovations. In Indonesia there was a prime example of such a leader:

> The Bupati was a great believer in maintaining the line of communication wide open between the people and the officials. It was his belief that the way to get the support and participation of people in development programs was to encourage a continuous dialogue between the people and the officials, between the people informed of government actions and plans, and to keep himself and his staff fully aware of the needs and problems of the people. . . . The Bupati made himself very easily accessible to all segments of the population; anyone could visit him freely on any matter. He constantly invited people from different parts of the district and listened to their ideas on various problems. He frequently traveled to all parts of the district. . . . The administrative staff of the district including the subdistrict heads and village heads were required to visit frequently with village people, inquire about their problems, and find out their opinion on various matters. (19)

This quotation also illustrates the very close relationship between participation and effective *communication*; the two are almost inseparable. The function of the leader or the innovation implementer is largely to use and suitably combine various means of communication, including small and large meetings and personal contacts, to bring about connexions and a sense of cohesion and identification around the innovation project and its objectives.

ROLE OF THE MEDIA IN ACHIEVING PARTICIPATION AND GAINING ACCEPTANCE FOR THE INNOVATION

The discussion so far has dealt with *who* needs to be involved in an innovation, but very little with *how* people can be involved. Earlier in the chapter, several 'levels' of participation were proposed:

(a) awareness
(b) being informed
(c) representational consent
(d) direct consent
(e) vicarious participation
(f) full participation

TABLE 7.3. Media use to express need or to inform different groups

	Frequent*		Occasional*		Never*	
	Express need %	Inform %	Express need %	Inform %	Express need %	Inform %
Formal reports	35	56	54	40	11	4
Newspaper	34	22	39	67	26	11
Speeches	44	33	41	46	15	21
Radio	32	33	47	49	22	18
Film	**	18	**	15	**	68
Television	15	**	40	**	43	**
Leaflets	10	**	22	**	67	**
Large meetings	23	24	33	54	44	22
Small discussions	63	64	29	35	8	1
Personal discussions	**	74	**	25	**	1
Other	38	58	38	33	25	8

* 100% = Frequent + Occasional + Never separately for 'Express need' and 'Inform'.

** Item not included in this set of questions.

It is assumed that every member of a community should participate at the minimum level, but that it is desirable to achieve the higher levels for as many people as possible. The ways in which this can be achieved are many, but all involve the use of 'media', not just singly but co-ordinated and planned in relation to the stage reached by the project.

The term 'media' is used here in the broadest sense to include all forms of personal and group communication along with the vehicles for communicating, whether they be audio, visual or electronic. The range is suggested by Table 7.3 which displays some of the information about media use which was provided by our sample of Unesco-UNDP chief technical advisers and national project directors. First of all, it can be seen that a wide variety of media are employed in different projects, there being no tendency to rely on one to the exclusion of others. It is also clear that interpersonal media are by far the most popular, led by personal discussions (74 per cent 'frequent') and small group discussions (64 per cent). Political speeches were the most common form of mass media used to communicate the need for the innovation (44 per cent 'frequent') whereas the much weaker channel of formal reports was used most often to inform various groups on what was happening as the innovation progressed. Apart from this case, there appeared to be little difference in frequency of media use between 'need expressing' and 'informing'. Newspapers and radio were frequently used in about one-third of the projects and large meetings in about one-quarter. Film, television, leaflets, and other media assumed relatively little importance.

A more detailed statistical analysis of these data revealed that the use of speeches, radio, newspapers, and large meetings were highly correlated with each other; in other words, if a project used one, it tended to use the others also. This finding could have a double interpretation: on the one hand, it could mean that all such projects are highly politicized, representing major committments by the ruling political parties and hence the subject of much attention by those media which are most likely to be subject to political control; on the other hand, it could mean that in these countries and projects a generally more vigorous and more public effort is undertaken to involve all the people in innovations. The latter interpretation gains some further support from other statistical analyses which were made of all the data in the survey, taken together. Several clusters of variables emerge as related to one another. The largest and strongest of these clusters included the items representing these so-called 'political' media and shows that they are related in turn to a tendency to use all kinds of participative strategies (discussed more fully in Chapter IX).

Finally, it should be noted that the media items *as a whole*, as listed in Table 7.3, are moderately correlated with the participation items as a whole, as listed in Table 7.2, (r =.25). This finding supports the view that the use of media and the problem of participation are related to each other in important ways and should be considered together.

Some further remarks on the major types of media may be supported in part by sources from the literature.

Speeches and large meetings

As noted earlier, continuous support by political leadership is often viewed as an essential prerequisite for changes which are supposed to have national impact. The role of speeches in this process appears to be two-fold. On the one hand, through speeches the leader extends awareness of and interest in the project to a much wider audience, serving notice to any would-be resisters that they may have more than the innovators to contend with if they try to obstruct. On the other hand, through the process of preparing and delivering the speech the leader becomes much better informed himself and in fact becomes an active participant and collaborator.

Speeches are undoubtedly important motivational events which should punctuate critical points in the life of a project, but they are a notably poor medium in many respects, for example, they are totally inadequate for conveying technical information of any complexity; therefore they cannot be used effectively on their own for training or didactic purposes. Furthermore, they reach at best only a small fraction of the population, only those who can be assembled at a given time. Finally, the only record is the listener's memory, and this will vary greatly from one person to another. Hence, an effective effort to gain participation and to communicate the essentials of an innovation must rely on many other forms of communication in conjunction with speeches and large meetings.

Radio

In many ways, radio is an electronic extension of the speech medium, having many of its advantages and defects. However, in one very important respect radio has an advantage over the speech and the large public gathering: it is not necessary to assemble everyone in the same place. Radio also has special properties which have made it very popular in recent years as a vehicle and element in educational innovation in developing countries: (1) it is low in cost for both transmission and reception over wide areas with contemporary transistorized technology, and (2) its use does not require literacy. Some of the most popular and apparently successful projects of educational innovation reported in the literature from developing countries have involved radio. Among these we should cite first and foremost the ACPO project in Colombia and the series of functional literacy projects in Tanzania which have been centred on radio study group campaigns.

Some of the special advantages of radio are noted by Brumberg:

> The news program was found to be one of the most popular broadcasts of Radio Sutatenza and had the greatest audience for the 7 a.m. and 7 p.m. presentations. From the results it was concluded that the news program served four purposes: 1) creation of interest in national affairs; 2) creation of national identity and consciousness; 3) creation of public opinion; and 4) motivation of organization for public action. (20)

However, as Brumberg and many other observers have pointed out, radio is not effective unless it is used in combination with other media, notably printed materials.

> ACPO has demonstrated that the mass media can be effectively utilized to reach a sizable rural population which is both widely dispersed and isolated. It was found, however, that one medium, namely radio, was not in itself a sufficient teaching vehicle. Printed matter in the form of textbooks, newspapers, and special readers were required in order to reinforce the radio messages. (21)

How radio can be used to maximum effect is again illustrated very well in Brumberg's account of ACPO:

> The key example of internal integration is the radio schools. A given class brings together the radio course, the appropriate textbook, the physical equipment (radio, blackboard and chalk, paper and pencils) and the auxiliar immediato. The radio lesson provides a quasi-personal stimulus to the students. The radio teacher covers specific textbook material, explains and expands the content, asks and answers questions, and directs performance of exercises. The auxiliary sees that students are ready for the broadcast and to follow the program text material. He also assists in performance and checks responses. The weekly newspaper reinforces the content of the materials presented via radio and textbook and also serves to reinforce the reading ability of students. The special book series goes a step further in amplifying techniques and knowledge. It is important to note that the same teaching staff is responsible for radio class production, editing of textbooks and special book series, and writing of the newspaper's knowledge section. (22)

While much more could be said on the subject of radio in educational innovation, it seems preferable to direct the reader to other sources for guidance in this area. Schramm's book, *Big Media, Little Media*, is an excellent source, and on the specific subject of radio study group campaigns, Grenholm's study for the IBE, *Radio study group campaigns in the United Republic of Tanzania.* Hall and Zikambona have provided an excellent narrative account together with evaluative data on what happened in the highly successful 'Man is Health' campaign in Tanzania (23). Their account suggests that the radio aspect of the campaign may well have been over-rated; various material and technical problems drastically reduced the actual radio audience for most classes. Nevertheless the programme was successful in reaching double its expected audience, largely through the medium of its network of trainers and the materials provided.

Print

Print media have some obvious drawbacks for developing countries, not the least of which is the low level of literacy found in many of the rural areas which are the targets of innovation efforts. Yet there is no substitute for print as an essential tool of development. No other medium can store information for retrieval so efficiently or convey such a quantity and detail of technical information on any subject.

As seen in the examples mentioned above, print materials form an essential ingredient in effective educational campaigns. Newspapers in particular can be used as a means of promoting innovation among literate groups and as a means of building and maintaining literacy among those who are newly literate as a result of functional literacy campaigns. An example of the former type of use is provided by Orata:

> Another approach is to have a newspaperman write up the story and report it in one of the dailies. In front of me is such an article prepared by Mr Candido Dabuet in today's (17 August) *Manila Times.* In the article, the following is written:
>
> *'The people are wondering why their mayor is against the opening of these rural and community high schools. Some sectors believe that the reason the Mayor is against the idea of rural high schools is that the income of the lone private secondary school in that town will be adversely affected if the rural high schools are opened.'*
>
> It will take more than the Mayor can stand to continue opposing the opening of barrio high schools in his town now that his possible reason (could there be any other reason?) is feared and exposed. It bears watching. (24)

Nevertheless, the effectiveness of newspapers for the promotion of innovation will depend heavily on the readership in the particular community which is to be affected.

An example of the second type of use is provided by the ACPO project in Colombia. A newspaper, *El Campesino*, is specifically written and produced for the rural peasant population which has been the target of the literacy programme. In addition the project produces books and other educational materials for the same audience:

> Just as *El Campesino* is intended to provide a newspaper designed and written specifically for the campesinos, the Biblioteca del Campesino (Campesino Library) is designed to provide books appropriate to a rural audience. In both cases, there is a recognition of the fact that, in order to retain their literacy skills, the students need reading material that is written at a level they can comprehend, is easily and cheaply available, and is of interest. (25)

To sustain this very large print output, ACPO has its own publishing operation:

> ACPO's educational materials are printed by Editorial Andes, which ACPO owns. One of the five largest printing firms in Colombia, Editorial Andes employs approximately 130 persons. Commercial work constitutes about 75 per cent of the Editorial Andes plant's traffic, and the profit from such work, which is undisclosed, goes into the general ACPO budget.
>
> The plant is well equipped to do almost any kind of printing job, from calendars and labels to comic books and financial reports. Its equipment, much of it donated, includes both letter-press and offset equipment and an extensive photo-engraving department capable of doing fine quality color separation. (26)

Orchestrating the media to maximize participation

Studies of the diffusion of innovations stress the need for multiple strategies employing different media in combination with personal influence to effect change. Thus Rogers and Shoemaker (27) note that even when the most effective mass media are used with the best-constructed messages there is likely to be little effect on user behaviour unless the opinion leaders in the community (see Figure 34) are already favourable and are spreading word by informal personal means. It is also generally the case that a single, one-time use of a medium is ineffective even to create awareness; instead, the repeated use of a variety of media over time tends to be the best approach. Assuming that the innovators have limited resources, the implication is that careful planning and orchestrating of media efforts is essential. ACPO, which is perhaps the most successful of the cases of educational innovation which we have analysed, makes ample use of what may be called the 'synergy' principle, as revealed in the following quotation:

> ACPO has adopted extensive mass media techniques to carry its program to all rural Colombians. It owns the largest and most powerful radio network in Colombia (500 kilowatts of radio transmitting power). ACPO also produces high-volume low-cost printed matter in the form of a textbook series with supplementary reading materials, and the largest circulating weekly newspaper

> in the country. It produces phonograph records, and, most recently, has experimented with tape cassettes. As a complement to the mass media employed, ACPO has developed an extensive network of local workers (predominantly volunteer) and two institutes for the training of rural personnel. Finally, it has encouraged written correspondence as feedback from the rural population to the central ACPO organization. (28)

To this should be added the fact that ACPO makes extensive use of informal opinion leaders represented by the local priests.

DIALOGUE

This chapter may conclude by drawing attention once more to the importance of creating dialogue processes at various levels and across levels of the hierarchy in order to build a sense of participation in the innovation on the part of the community or the country which is being served. The previous chapter noted the need for dialogue between the outside and national experts. This is equally necessary for those within the project itself, and then between them and people outside the project. Obviously, certain choices of strategy must be made, since creating genuine two-way interaction on needs and solutions cannot be undertaken with every member of the society. However, if the leaders and selected representatives are allowed to enter such a dialogue, *and* if this dialogue process is then communicated to the rest of the population, there is likely to be a widespread sense of vicarious participation which will serve essentially the same purpose, making the people cohesive around the goals of the innovation, opening doors everywhere, and infusing the project with energy and enthusiasm.

The role of feedback from the people is noted in the last quotation, but the same source records a certain lack of complacency about the process.

> Related to the problem of feedback is the need of the campesinos to communicate their needs, interests, and desires to the agencies concerned with rural development. These include ACPO and the various agencies of the central government. At present the campesinos have little voice in the development of ACPO's programs, nor has ACPO systematically solicited their views. This is now recognized by ACPO, which plans to involve campesinos more directly in the selection of content and editorial position of *El Campesino*, making the newspaper more a voice of the campesinos than the voice of ACPO. (29)

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CHAPTER EIGHT

Barriers to innovation

Following the repeated comments in the foregoing chapters on one or another of the many barriers to innovation, it may now be useful for some readers to have all these points brought together and summarized in one place. Chapter III, in the discussion of the 'alternative of grandeur', introduced a list of such barriers ranging from procedural and technical to social and personal. Indeed, a complete analysis of barriers to innovation requires an integration of understandings from the perspective of practically every discipline, in particular economics, history, geography, political science, anthropology, psychology and sociology. To a large extent, each country and each innovative situation represent a unique configuration of elements related to each of these disciplines. Therefore the summary analysis offered here can be only a very tentative guide, perhaps suggesting to the project director the types of problems he should look for and guard against.

We have approached our task by (a) dividing the topic into several 'disciplinary' domains, (b) generating a number of questions within each domain which were then rated by our expert informants, and (c) subjecting the resulting pool of data to statistical summarization which was as free as possible from personal bias.

One problem which readers may have with this chapter is the negative impression which is always left when one concentrates on 'barriers' rather than 'facilitators', 'weaknesses' rather than 'strengths', or 'what went wrong' rather than 'what went right'. To overcome this difficulty we will try to indicate ways to overcome these barriers where such have come to our attention. However, the larger task of finding solutions to the problems of innovation and of guiding the innovator to specific practical steps will have to be left essentially to future works. For now all we can provide is a first attempt at listing the major facts and happenings which are likely to get a new project into trouble.

OUR METHOD

We began this aspect of the project by listing what we felt to be the major areas of the social sciences which have had something to say about innovation in developing countries. We included 'geographic', 'historical', 'political', 'socio-cultural', 'psychological' and 'economic'. To this set we added a category called 'procedural' to encompass the various events that are likely to take place in the life of a project which do not belong clearly in any of the above 'disciplinary' groupings; it included the structure and administration of the project, lines of authority, decision-making, technical assistance, materials and manpower. Under each heading, working from the literature and our collective experience, we generated a pool of 67 items. This list still contained a large element of subjectivity and was far from exhaustive; yet it came close to the limits of what we thought we could ask of our respondents in the time available. There were 18 items under 'procedural'; 5 'geographic'; 6 'historical'; 7 'sociocultural'; 11 'political'; 12 'economic'; and 8 'personal'.

These 67 items were then included in the questionnaire to the Unesco-UNDP project directors and chief technical advisers as a checklist with the following instructions:

> A number of situations may cause difficulties for a project at various times.
>
> A difficulty may be a delay, a shortage, a conflict or a problem of some kind. Many such difficulties are normal and predictable and most may be easily overcome. Nevertheless, because experts differ on the relative importance of different factors, it would be most useful to have your judgement of these areas in the light of your specific field experience. Topics are listed in seven major groupings including geographic, historic, socio-cultural, political, economic, procedural and personal. There is also some necessary repetition and overlapping questions.
>
> We would like you to judge the potential seriousness of each of these difficulties by checking the appropriate box after each item. For each set of items first rate the 'in general' summary item, then the separate subitems. Also please add your own items if you feel this list is incomplete.

The items were then listed as in the following sample:

	Extremely serious	Very serious	Somewhat serious	Observed but not serious	Not observed by me
Colonial rule left the country very suspicious of foreigners					
Ruling élites traditionally opposed to innovation or to expansion in education sphere					

Items were grouped according to the main headings indicated above. Within each of the seven categories we offered two additional choices, '- - - in general', and 'other' with the same set of response choices, as illustrated in the following sample:

	Extremely serious	Very serious	Somewhat serious	Observed but not serious	Not observed by me
Political factors in general					
Disputes among different political parties or factions					
Objections to project by special interest groups					
etc. ---------					
etc. ---------					
Other political factors (specify and rate seriousness)					

In fact, however, there was some confusion on the part of most respondents about the meaning of the 'in general' category, so that it was not used in our analysis. Very few respondents took advantage of the 'other' category, leaving us with the sense that there had been no glaring omissions.

Approximately 90 per cent of the 81 experts in our sample responded to most of the items with the exception of the 'general' and 'other' categories. The resulting data have been analysed in a number of different ways. First of all, a simple tabulation of the number of 'serious' responses shows wide discrepancies among items and among our seven main categories. These findings will be reported first in the section which follows. After frequencies were tabulated, we selected 42 items from the original pool of 67 for more intensive analysis, discarding those items which received the smallest number of 'serious' responses. Each item was then correlated with each other item and the resulting matrix was reduced to six 'factors' or clusters of items which were highly correlated with each other. The specific technique was a 'principal components factor analysis' followed by a 'varimax factor rotation'. The latter procedure provides us with dimensions which are clearly represented by a small number of items and are therefore relatively easy to explain. The six factors which emerged explained 56 per cent of all the variance accounted for by responses to these 42 items. Thus, it represents a considerable achievement in data reduction on the one hand, but leaves a substantial residual which may be inherent in the specific content of the items themselves.

A substantial part of this chapter rests on the further analysis and explanation of these six factors, supported by numerous quotations from our prime literature sources. We came to rely on these six factors as our primary form of barriers analysis, reconfiguring the earlier 'disciplinary' categories for three major reasons. First of all, they are derived by purely statistical means and can, for that reason, lay some claim to empirical validity although our sample is relatively small and specialized and the item pool may itself have been drawn in a biased manner. Secondly, and perhaps more importantly, once we began to look at and think about these clusters, they started to make sense, intuitively. Thirdly, the six factors proved to be a rather good set of categories with which to describe much of the information on barriers which we had derived from interviews and readings, even though they cut across the disciplinary dimensions with which we began. Thus we hope to have come closer to an analysis of innovation barriers which is truly *inter*-disciplinary.

WHAT SPECIFIC BARRIERS ARE RATED AS MOST 'SERIOUS'?

Analysis according to the seven preconceived dimensions

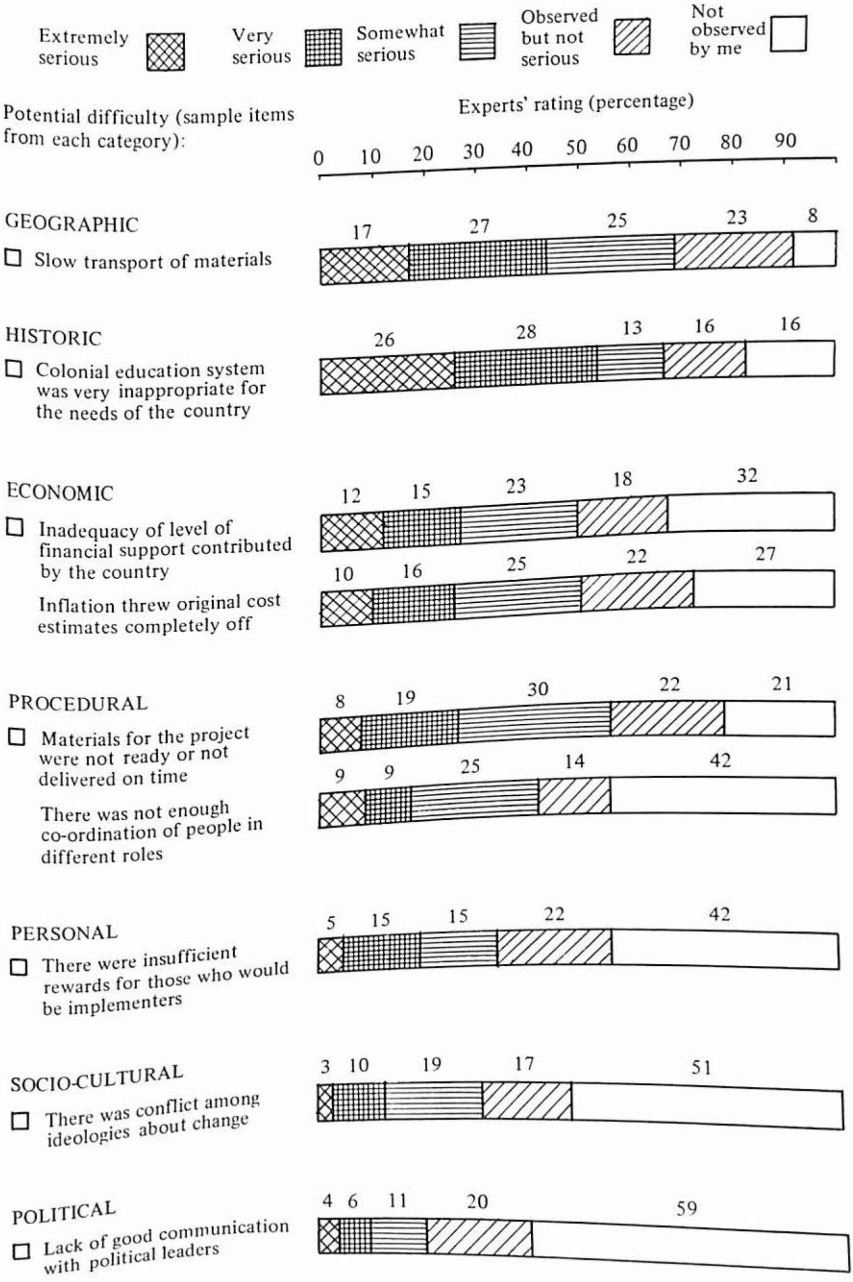
The essence of the raw findings is reasonably conveyed in Figure 39, although the figure includes only an illustrative sample of items in each category. Geographic items were rated as most serious; historical items in general ranked second; economic, third; procedural, fourth; personal, fifth; socio-cultural, sixth; and political, last. Particularly in the case of the political items, however, we are inclined to place little confidence in a simple interpretation that these were unimportant or that this rank ordering of dimensions was the best representation of the findings. Indeed, our subsequent factor analysis (*v*. p. 226), strongly confirms these suspicions. Nevertheless, the findings are offered in both forms to allow the reader to draw his own conclusions. The following summary indicates what the findings appear to show when cast in their simplest form.

Geographic barriers

Geographic difficulties, which included 'long distances', 'slow transport', 'isolation' and 'poor climatic conditions', were rated as the most serious category of difficulty. Among this set of items, 'slow transport of materials', was the most frequently checked of the entire list of 67, and was rated as a 'serious' difficulty by 69 per cent of respondents. Second in importance within this geographic set was the item, 'persons who should have been involved in the project were difficult to locate', with 61 per cent rating this as 'serious'.

The pervasiveness of the geographical difficulties, especially as they affect the

FIGURE 39. Barriers to innovations: selected from responses of eighty-one experts to a list of sixty-seven items. .



timely delivery and distribution of materials, is impressive. They suggest that major efforts should be made to include these considerations in the planning and budgeting phases of new projects. There would also appear to be a need for sharing solutions to these problems which have been found in different countries. While geographic conditions differ widely between countries and between regions within countries, there are nevertheless some broad categories of such conditions which are similar in selected regions around the globe. There might be a real need for a handbook which specifies both problems and alternative solutions which have been tried for given geographic configurations.

Historical barriers

Second in over-all importance were the items dealing with historical factors such as colonial rule, traditions opposing innovation, and the struggle for independence. More specifically, 66 per cent considered it a serious difficulty that the 'colonial education system was very inappropriate to the needs of the country' and, moreover, 25 per cent rated this as 'extremely serious'.

Regarding historical factors, the negative effects of a colonial past were noted in the great majority of countries with such a past. We need to know more about the specific nature of the difficulties created by a colonial heritage. It has often been observed informally that education systems in the Third World reflect their former European counterparts rather as the funny mirrors at a carnival reflect our bodies. No doubt many vestiges of former colonial education systems remain appropriate or even essential long after the colonists have gone, but others clearly do not. Nationals seeking to reform and rebuild their systems to fit the present times and a new conception of nationhood may need help in deciding which is which. One important objective for research workers should be to sort out these variables and to provide some sort of guidelines from a cross-cultural perspective.

Economic barriers

Third in over-all importance were economic factors. Three items stood out most strongly in this set. These were: 'inadequacy of financial support contributed by the country' (in contrast to the amount contributed by outside sources, in most cases UNDP), rated by 52 per cent as 'serious'; 'inflation threw the original cost estimates completely off', 48 per cent found 'serious'; and 'the economic condition of the country as a whole', 45 per cent rated as 'serious'. It was also noted by 44 per cent that 'costs were generally underestimated even without considering the effect of inflation'.

The economic factors are perhaps most noteworthy in that they do *not* dominate all the others in importance. It is evident, however, that national governments have difficulty in meeting their financial commitments to share the costs of projects with the UNDP and other external aid sources. Furthermore, it was noted in the interviews that long delays in funding were the rule rather than the exception, and sometimes they lead to strange anomalies in implementation; one expert related that the facility which was supposed to house his project and to provide a laboratory for training purposes would not in fact be ready until after the project had terminated and the external advisers had gone home. Obviously, there is a great need for flexibility in planning various stages of projects. It is also clear that more realism must be used in project budgeting; the findings show a persistent tendency to underestimate costs, even discounting the effects of spiralling inflation in many developing countries. On the positive side, very few respondents had observed serious mismanagement of project funds.

Procedural barriers

This category included the largest number of items and the most diverse set of items. Among various procedural difficulties cited, the most serious were: 'materials not delivered on time', 58 per cent; 'lack of skilled manpower to implement the project as planned', 52 per cent; 'not enough co-ordination of people in key roles', 42 per cent; 'insufficient quantity of materials', 40 per cent; and 'lack of agreement on project objectives', 40 per cent. As shown on page 229, there was indeed a procedural factor which emerged from the factor analysis but we shall reserve comment here since the items in this set did not cluster together very clearly.

Personal barriers

Ranking fifth in 'seriousness' over-all were a cluster of items identified as 'personal factors' on the questionnaire. Of these eight items the strongest were: 'there were insufficient rewards for those who would be implementers', 36 per cent rating this as 'serious'; 'persons in key roles were not open to change their attitudes or behaviour', 32 per cent. Also cited by several experts were 'rigid and narrow understanding of the project by key persons', and 'personality conflicts'. Very few reported 'a lack of persistence by advocates of the project' and very few reported that 'key persons were too loose and broad in their understanding of the project'. Personal and interpersonal factors clearly deserve more mention in reports and case studies of innovation. When experienced project managers and advisers speak off the record, the importance of these factors comes very much to the fore. Clearly, for example, more attention needs to be given to providing the proper incentives so that the most appropriate individuals with the right skills will be motivated to join the project and to stay with it for a meaningful period, devoting to it their full energies and enthusiasm.

Social and cultural barriers

Under social and cultural factors the most significant item was 'conflict among ideologies about change' with 33 per cent marking 'serious'. Other noteworthy items in this set were 'poor climate for sharing ideas openly', 'significant differences in cultural values' and 'inadequate social harmony' among project team members.

Political barriers

Lowest ranked in seriousness as a group were the set of items which we labelled 'political'. While political factors as a whole were not rated as very serious, they clearly were very serious for some projects. For example, 20 per cent rated 'lack of good communication with political leaders' as a serious problem. Other politically related problems which various experts found serious were 'changing governments makes it more difficult to maintain consistent policy and to follow plans', 'educators on the project did not understand political realities', 'objections to the project by special interest groups', and 'lack of understanding' and 'lack of interest' by political leaders. It may be that many respondents were reluctant to cite political factors on a questionnaire form of this type. Support for this assumption comes from the fact that political factors were frequently mentioned in follow-up interviews which were conducted with several conference participants.

We feel that the responses to political items in this list of potential project 'difficulties' represents only the tip of an iceberg. This view is confirmed most strongly by experts' comments made in interviews and off the record. (In fact all the responses to the questionnaire as well as to the interviews were strictly anonymous.) They made it clear that they had to have or to develop quickly a number of political skills in order to survive and in order to keep the project intact. They had to know whether issues were politically settled or divisive. They also had to know how to communicate with political leaders and how to enlist their support, often at the very highest level. Continued awareness of, and pleasure with, a project on the part of these political leaders was often necessary to maintain support and to ensure continuation and expansion. In addition, such projects had to be seen as contributing in a manifest way to the social and economic development of the country as a whole. It was especially desirable in many cases to receive widespread support from different factions to ensure that the project would survive changes in policies and political philosophies as governments changed.

These impressions are strongly reinforced by the literature and by our analysis of Unesco project evaluation reports (see chapter III and VII and p. 231 of this chapter for further elucidation).

THE MAJOR BARRIER FACTORS

Any item such as those used on our 'barrier' list represents a combination of meanings both to the person who developed the item and to the respondent; the shades of meaning may also be different for different respondents, so that what seemed 'obvious' as an interpretation when the item was drafted may turn out to be the least salient aspect of the item upon later analysis. Most items have several meanings which can only be separated when we see how a group of people respond to the whole set. When responses to different items are compared, certain items begin to cluster together; in other words, certain respondents tend to respond identically to sets of items. It is then possible to examine the apparent verbal content of these clusters of items, searching for common elements which can then be used to label the underlying dimension to which they appear to be responding. Thus there are two tasks involved: first, a *statistical task* of relating all the items to all the other items and then identifying the clusters. Second comes the *intellectual task* of finding the common meanings and labelling them appropriately. There is then a third task of relating the identified and labelled factors to already existing knowledge, experience, 'common sense', and what has been said in the literature which seems to correspond to what has been uncovered by statistical means.

The statistical task will be considered first. The specific procedure followed is the product-moment correlation described earlier in the text. From the original list of 67 items, 42 were selected and related to each other, yielding a matrix of 861 correlations. The theoretical range of each correlation would be from - 1.00, indicating a completely inverse relationship to + 1.00, indicating that the items elicit exactly the same response. A correlation of 0.00 would indicate that there is no relationship whatever between the two items and that the response of a particular person to the one item could in no way predict the response of the same person to the other item. Within this range it is a matter of judgement as to what constitutes a meaningful relationship. For the typical correlation reported here in which approximately 70 persons give a response to each of the compared items a correlation of .20 would be considered 'significant' in a purely statistical sense; all this means that there is a 95 per cent chance that the true correlation between the two items is greater than zero. We find, in fact, that most of the 'barrier' items are significantly correlated with each other in this sense and many are strongly so, as is well illustrated in the sample matrix of Table 8.2.

Factor analysis is a procedure by which the most highly correlated items are grouped together. Readers who wish to follow the technical details of this procedure should consult the appropriate statistical texts which cover contemporary procedure for multivariate analysis. However, it will suffice for the layman to understand that there are many alternative ways to generate these clusters. Our choice was the 'varimax' method which selects items on a combined criterion of high intra-cluster relationships and low extra-cluster relationships.

The most useful set of factors should not only represent clear and distinct dimensions both statistically and common-sensically but should also explain a large proportion of the variation of response contained within the total set of items. A stronger or more important factor will explain a larger portion of this shared variance. While the total number of 'factors' which can be extracted is as great as the number of items in the correlation matrix, a factor will have very little utility as a way of summarizing (and hence reducing the complexity) when it explains less than 5 per cent of the variance. Hence we stopped with only six factors which accounted for 56 per cent of the shared variance among the 42 items. The resulting six factors are identified in Table 8.1.

Table 8.1. The six principal Barrier Factors.

Factor	Summary label	% of total variance explained	Number of items with loadings > .40
B-I	UNDERESTIMATING THE PROCESS Poor co-ordination and connexion to political leaders, confusion and inadequate planning	17	16
B-II	PERSONALITY CONFLICT AND MOTIVATION Understanding others, energy lack, rigidity, no openness to change, insufficient personal rewards	12	10
B-III	UNDERDEVELOPMENT Slow transport, materials delay, colonial vestiges, manpower lacks, long distances, inflation	9	10
B-IV	FINANCIAL PROBLEMS Not enough financial support from inside or outside, economic conditions and priorities	8	6
B-V	OPPOSITION FROM KEY GROUPS Ruling élites oppose, conflicting ideologies, slow implementation, objections from special interests	5	5
B-VI	POOR SOCIAL RELATIONS Problems between team members and others, disharmony within project	5	4

This table also introduces the concept of 'loadings', which are merely the correlations between individual items and the factor as a whole. They can be interpreted in exactly the same way as correlations and they range in the same manner between -1.00 and +1.00. A factor is therefore best represented by those items which have the highest loadings.

How factors emerge from a correlation matrix can be partially suggested by Table 8.2 which represents the correlations among the pairs of items which each have the to survive and in order to keep the project intact. They had to know whether issues were politically settled or divisive. They also had to know how to communicate with political leaders and how to enlist their support, often at the very highest level. Continued awareness of, and pleasure with, a project on the part of these political leaders was often necessary to maintain support and to ensure continuation and expansion. In addition, such projects had to be seen as contributing in a manifest way to the social and economic development of the country as a whole. It was especially desirable in many cases to receive widespread support from different factions to ensure that the project would survive changes in policies and political philosophies as governments changed.

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THE MAJOR BARRIER FACTORS

Any item such as those used on our 'barrier' list represents a combination of meanings both to the person who developed the item and to the respondent; the shades of meaning may also be different for different respondents, so that what seemed 'obvious' as an interpretation when the item was drafted may turn out to be the least salient aspect of the item upon later analysis. Most items have several meanings which can only be separated when we see how a group of people respond to the whole set. When responses to different items are compared, certain items begin to cluster together; in other words, certain respondents tend to respond identically to sets of items. It is then possible to examine the apparent verbal content of these clusters of items, searching for common elements which can then be used to label the underlying dimension to which they appear to be responding. Thus there are two tasks involved: first, a *statistical task* of relating all the items to all the other items and then identifying the clusters. Second comes the *intellectual task* of finding the common meanings and labelling them appropriately. There is then a third task of relating the identified and labelled factors to already existing knowledge, experience, 'common sense', and what has been said in the literature which seems to correspond to what has been uncovered by statistical means.

The statistical task will be considered first. The specific procedure followed is the product-moment correlation described earlier in the text. From the original list of 67 items, 42 were selected and related to each other, yielding a matrix of 861 correlations. The theoretical range of each correlation would be from − 1.00, indicating a completely inverse relationship to + 1.00, indicating that the items elicit exactly the same response. A correlation of 0.00 would indicate that there is no relationship whatever between the two items and that the response of a particular person to the one item could in no way predict the response of the same person to the other item. Within this range it is a matter of judgement as to what constitutes a meaningful relationship. For the typical correlation reported here in which approximately 70 persons give a response to each of the compared items a correlation of .20 would be considered 'significant' in a purely statistical sense; all this means that there is a 95 per cent chance that the true correlation between the two items is greater than zero. We find, in fact, that most of the 'barrier' items are significantly correlated with each other in this sense and many are strongly so, as is well illustrated in the sample matrix of Table 8.2.

Factor analysis is a procedure by which the most highly correlated items are grouped together. Readers who wish to follow the technical details of this procedure should consult the appropriate statistical texts which cover contemporary procedure for multivariate analysis. However, it will suffice for the layman to understand that there are many alternative ways to generate these clusters. Our choice was the 'varimax' method which selects items on a combined criterion of high intra-cluster relationships and low extra-cluster relationships.

The most useful set of factors should not only represent clear and distinct dimensions both statistically and common-sensically but should also explain a large proportion of the variation of response contained within the total set of items. A stronger or more important factor will explain a larger portion of this shared variance. While the total number of 'factors' which can be extracted is as great as the number of items in the correlation matrix, a factor will have very little utility as a way of summarizing (and hence reducing the complexity) when it explains less than 5 per cent of the variance. Hence we stopped with only six factors which accounted for 56 per cent of the shared variance among the 42 items. The resulting six factors are identified in Table 8.1.

Table 8.1. The six principal Barrier Factors.

Factor	Summary label	% of total variance explained	Number of items with loadings > .40
B-I	UNDERESTIMATING THE PROCESS Poor co-ordination and connexion to political leaders, confusion and inadequate planning	17	16
B-II	PERSONALITY CONFLICT AND MOTIVATION Understanding others, energy lack, rigidity, no openness to change, insufficient personal rewards	12	10
B-III	UNDERDEVELOPMENT Slow transport, materials delay, colonial vestiges, manpower lacks, long distances, inflation	9	10
B-IV	FINANCIAL PROBLEMS Not enough financial support from inside or outside, economic conditions and priorities	8	6
B-V	OPPOSITION FROM KEY GROUPS Ruling élites oppose, conflicting ideologies, slow implementation, objections from special interests	5	5
B-VI	POOR SOCIAL RELATIONS Problems between team members and others, disharmony within project	5	4

This table also introduces the concept of 'loadings', which are merely the correlations between individual items and the factor as a whole. They can be interpreted in exactly the same way as correlations and they range in the same manner between -1.00 and +1.00. A factor is therefore best represented by those items which have the highest loadings.

How factors emerge from a correlation matrix can be partially suggested by Table 8.2 which represents the correlations among the pairs of items which each have the

TABLE 8.2. Correlations among highest loading items on Barrier Factors

		I		II		III		IV		V		VI	
		a	b	a	b	a	b	a	b	a	b	a	b
I.	a. Poor co-ordination	–	.57										
	b. Lack of political understanding	.57	–										
II.	a. Personality conflicts	.27	.22	–	.82								
	b. Lack of understanding of others' feelings	.19	.23	.82	–								
III.	a. Slow transport	.20	.29	.17	.19	–	.69						
	b. Materials delayed	.19	.31	.39	.39	.69	–						
IV.	a. National contribution too low	.34	.44	.06	.12	.34	.40	–	.54				
	b. Outside contribution too low	.19	.21	.33	.28	.28	.41	.54	–				
V.	a. Ruling élites oppose	.10	-.04	.20	.29	.08	.11	.14	.22	–	.50		
	b. Conflicting ideologies	.43	.23	.19	.29	.24	.14	.17	.12	.50	–		
VI.	a. Relations with others	.54	.35	.63	.58	.18	.35	.28	.22	-.04	.39	–	.81
	b. Relations within team	.33	.28	.68	.60	.20	.30	.17	.26	.01	.29	.81	–

highest loadings on their respective factors. Note in this table that these items are more highly correlated with each other than they are with any of the other variables. This can be noted by observing that the top correlation in each column is the highest for that column, and that the correlation furthest to the right on each row is the highest for that row. It can also be seen in this table that there are significant and in some cases quite strong relationships between some of the factors, notably between II and VI, III and IV, I and VI, and I and IV.

Barrier Factor I: underestimating the process of innovation

The first barrier factor is the most important and also the most complex of the six, explaining the most variance (17 per cent) and including the largest number of items with loadings above .40 (16). We chose ten of these items as the most descriptive and least overlapping with other factors, and these are listed in Table 8.3. This set of items, taken together, strongly reflects the pattern of troubles which encounter the 'alternative of grandeur' described at length in chapter III: a project too large and too ambitious for the capacities of the implementers and for the structure of the receiving system. Inadequate planning, inadequate consideration of implementation, poor connexions, and confusion about objectives seem to go together. What is really suggested is that many projects pay little heed to the lessons about the innovation process which we have stressed throughout this book, particularly to the fact that innovation is a problem of *system change* and system building which must start with a thorough appreciation of the existing connexions and the existing bases for social cohesion and organization.

TABLE 8.3. Barrier Factor I: the innovation as a new system – underestimating the process

Item	% rating as 'serious'	Degree of relationship to this factor (1.00 = highest)
a. Not enough co-ordination of people in different roles	43	.70
b. Insufficiently clear structure for decision making	30	.68
c. Lack of common understanding of project objectives	38	.67
d. Lack of good communication with political leaders	21	.60
e. Too much centralization of decision making	30	.67
f. Too many rules and regulations which had to be followed	26	.60
g. Formal authority to begin project was delayed	25	.48
h. Inadequate consideration of problems of implementation	34	.61
i. Educators on project did not understand political realities	15	.76
j. Pressure from political leaders to produce results in too short a period of time	12	.51

Phenomena associated with Factor I are very often reported in the literature. For example, Unesco's report on the Experimental World Literacy Programme includes the following illuminating comment on the early stages of the Iranian project:

> Throughout the project's duration, it was beset by various setbacks in the implementation of planned social and economic development projects, thus creating confusion and lack of certainty with regard to what directions the vocational side of the functional literacy instruction should take.
>
> Major problems were associated with internal administration, at both the central and field levels. Unesco had a difficult time co-ordinating the travel, and identifying the specific duties, of the international expert staff. Regional directors and their subsidiary colleagues were often absent, and for the first three years of the project, administrative malaise was commonplace. (1)

Bhola, in his pungently written case study, *The India Education Project* makes some sharp observations which are also much in line with this factor:

> Where resources are available, institution builders may be able to overwhelm the old with the new; that is, they may be able to bring in enough people with new commitments and skills that older personnel may be buried in the influx. However, institution builders should plan to contain the past of an organization rather than condemn it. Individuals who have spent major parts of their lives within an organization develop deeply felt identifications with the organization. For many, their sense of personal worth comes to be rooted in what they do and have done for the organization. If the organization's past is rejected and regretted by the new order, a vehement defense and a certain schism could result. (2)

Bhola's observations characterize the 'bull-in-the-china-shop' effects of many well-intentioned projects. Of all aspects of this factor none is more important than the necessity of building and maintaining contacts with the *key* political leadership of the country, not merely the bureaucracy. Prosser's account of the Jamaican residential camps is one of the clearest examples of this type of barrier.

> Although the camps originated in a powerful Ministry of Education, their rapid transfer to 'social welare' where they remained reflects the prevalent view of most government bureaucracies that such activities are primarily 'social'.
>
> The rubric 'social welfare' would matter little, if it were not associated with deleterious consequences, especially in government budget allocation and planning. The common interpretation that social activities are economically unproductive usually results in 'social' ministries having a weak political clout, and their programs being more frequently hamstrung for finance and staffing than their counterparts in economic or 'production' ministries. In its infancy and after being transferred from the Ministry of Education, the new camp program rapidly lost status, salaries and staffing fell behind, and serious planning was abandoned. And so were created many of the serious problems the camp management found impossible to overcome.
>
> A lesson from this is to ensure that such programs gain and keep the political and governmental support from their inception and so safeguard a sufficient resource allocation for their continuing viability. (3)

Grabe makes the same sort of observation regarding the Upper Volta project which he studied.

> The ambivalent attitude of the government towards the objectives to be served by the program and the lack of comprehension of its aims by its clientele (or perhaps their shrewd reading of government ambivalence) obviously do not augur well for the program. It is doubtful that the program can be effectively expanded and the meaningful results can be achieved from it unless the stigma of blatant discrimination is removed from it and ways are found to restore its original purpose, that is, to serve as a precursor to a unified and realistic system of basic education for all children and youths. (4)

One important aspect of this factor is the notion of burial in the bureaucracy. On the one hand there is not enough genuine co-ordination and on the other there is too much centralization of decision making with elaborate rules and regulations delaying decisions *ad infinitum*. Such problems are particularly acute where more than one ministry or administrative authority is involved. This is often the case for non-formal and functional literacy projects. J. Hakemulder writes of a primary teacher training project in Kenya:

> Misunderstanding between several ministries, and also between departments of the same ministry, cause several difficulties; for example, a delay in payment of salaries to newly appointed school supervisors, an order to stop using cars because one department thought there was no money for it, etc.
>
> Some people can think only in 'channels of communication' and in terms of 'government machinery'; they miss the imagination and creativity when new ideas have to be implemented. (5)

Such entanglements were a frequent occurrence in the Experimental World Literacy Programme.

> In general, EWLP countries' attempt to transcend vertical ministerial structures encountered stubborn adherence to sectoral approaches. One project's co-ordination committee met only twice in four years; another's, once in three years. In one country, agricultural extension workers theoretically attached to the project had no contact with literacy intstructors, who were answerable to another ministry. In still another project, national, provincial and local co-ordination committees were simply ingnored, and work was accomplished (or not accomplished) through traditional intraministerial channels. Finally, there seems to have been no satisfactory and replicable solution to the autonomy co-ordination dilemma. Of the various patterns tried, modifed or discarded, none appears to correlate with success or failure. (6)

Clearly, very elaborate and/or sensitive planning is required to overcome such obstacles if indeed they can be overcome. Again, this is a matter of facing or not facing political realities. A given project may sound extremely good on an idealistic basis, but if it requires the extended co-operation of several agencies which have shown no past inclination to collaborate, it may be hopeless from the start.

Table 8.3 clearly presents a challenge of interpretation. The ten items do not appear to be addressing the same issues yet the fact remains that they are rather highly correlated. Hence the need to look for a chain of connexions or a thread of common *underlying* meaning. The best explanation may come from our earlier analysis of the 'alternative of grandeur' in chapter III. There we hypothesized a causal chain of troubles which begins with a lack of adequate preparation; at the beginning of the project nobody makes the very careful analysis of the receiving society and how it works and how it is likely to be impacted (a) by the innovation and (b) by the social subsystem which must be set up to implement the innovation. This lack of planning leads in turn to a lack of clarity both among the innovators and others as to exactly what the innovation is supposed to do. The lack of clarity in turn undercuts the support which the project requires from persons in key positions; it may also lead to personal alienation from the project (Factor II) and quarrelling (Factor VI). Without political support and with internal dissension the project becomes victim to the harassment of minor officials, rules and regulations; delays in authorizations get longer and longer; it is difficult to replace staff; materials fail to arrive on time. All these events have secondary repercussions on the reputation of the project and the morale of the remaining staff. Talented and idealistic innovators leave the project for more promising endeavours, leaving it to incompetents and 'looters'. This dismal scenario surely does not describe the typical project, but many of these causal links recur with enough frequency to explain the relationships among the Factor I items.

Overcoming Barrier Factor I. We should emphasize the fact that, if our causal hypothesis is correct, most of the troubles underlying Factor I are *avoidable*. Above all, they can be avoided by careful planning for implementation of the innovation and by building and maintaining connexions with key persons and groups. The type of planning is perhaps best exemplified by the Colombian ACPO project frequently referred to in this text. At every turn, ACPO has exploited local institutions and capacities and has planned its own activities to dovetail with public and private sector efforts, strengthening connexions and creating 'synergistic' effects. Here is but one example.

> ACPO has also worked with the Coffee Growers Federation to supply radios and organize radio schools in coffee-growing areas. It also works through the Agricultural Credit Bank to finance local sale of radios to campesinos and newspapers to local sellers.
>
> Through its radio programs and newspaper, it actively encourages its listeners to participate in local organizations, such as the Association of Lenders (those who receive bank credits) and local neighborhood organizations such as those sponsored by Acción Comunal. This agency attempts to promote local organizations (*juntas comunales*) and, in general, promotes self-help community agencies. (7)

Another part of the solution may be planning for *continuity* of key staff and advisers over the period of years. Mhina (8) cites the continuity of only two Nordic directors over a span of seven years as crucial to the success of the Kibaha Education Centre in the United Republic of Tanzania.

Another approach to the solution may be simply to 'think small' and keep a low profile (the 'local change' alternative described in chapter III). Some developing countries such as Kenya allow for far more decentralization and local initiative than do others. Kipkorir comments as follows:

> First, it must be stated that no one ministry or national body is yet in a position effectively to take cognizance of all the formal and nonformal endeavors and to plan for their integrated and harmonious development. While this function could be performed, for instance, by the Minstry of Finance and Planning, it is too far from a consensus in its thinking and too short in competent staff to assume such a task at this time. Thus individual formal and nonformal programs still develop along quite separate and often parallel paths. (9)

While the author appears to deplore this state of affairs to some extent, there is a brighter side in the avoidance of bureaucratic tangles which beset more ambitious, national-scale efforts. In his analysis of the small-scale industry programme in India, de Wilde clearly spells out the costs of national control.

> In the last analysis the only way in which SSIDO can obviate the necessity of establishing other organizations with largely similar responsibilities is to develop a staff sufficient in calibre and numbers to cope effectively with the tasks it is supposed to handle. It is unlikely that this can be done without converting SSIDO into an autonomus organization, largely independent of the government, and with sufficient freedom to determine its own staffing patterns, its own priorities, and its own salary scales and conditions of service. However, organizational autonomy alone will not be enough as long as it depends almost wholly on the government for its financing and is therefore presumably subject to considerable government supervision and control...
>
> Organizational and financial autonomy would also eliminate the hamstring effect on SSIDO of other government regulations and procedures. (10)

Finally, some of the problems of the Factor I variety may be ameliorated by the more realistic pacing of the introduction of innovations. Instead of insisting on or expecting great changes in the shortest possible time, projects should move ahead a step at a time, building at a pace which is not too far ahead of the capabilities of the host country. The writers of the report on Unesco's Experimental World Literacy Project reach such a conclusion.

> Perhaps it would be wiser–if international programming is to suit national needs (and not vice versa)–to impose no time limit on future world efforts in this field. EWLP's experience suggests that the tortoise may be more likely than the hare to cross the finishing-line first. At the international level, illiteracy may prove more vulnerable to persistent long-term action adapted to

> diverse national paces than to occasional short sprints which all participants are expected to run at the same speed. (11)

Barrier Factor II: personalities and personal motivation

The second factor, explaining 12 per cent of the variance and containing 10 items with loading above .40, is best represented by the seven items in Table 8.4. Compared to the first, this factor is relatively easy to interpret. Items 'a' and 'b', which are highly related to each other (r. =.82), are also the best representatives of the factor, clearly pointing to the importance of personality conflict and insensitivity. All the other items except 'e' contain some elements referring to the motivations and attitudes of individuals. We suspect that item 'e' is here also because the 'outside technical assistance' was construed in personal terms, i.e. the outside technical expert was at fault in not being understanding, in not having the right attitudes, in not being open-minded, etc.

Table 8.4. Barrier Factor II: Personalities and personal motivation

Item	% Rating as 'serious'	Loading (Degree of relationship to this factor) (100 = highest)
a. Personality conflicts among various members of the project team	23	.84
b. Some project members lacked understanding and appreciation of the feelings of others	24	.77
c. Persons in key roles did not devote enough energy and enthusiasm to the project	31	.59
d. Some key persons were too rigid and narrow-minded in their understanding of the project	25	.58
e. Outside technical assistance was faulty	22	.55
f. Persons in key roles were not open to change their attitudes or behaviour	32	.55
g. Insufficient rewards for those who would be implementers	35	.48

Taken as a whole, this cluster of items suggests that psychological issues cannot be ignored in the planning of innovations and that considerable care needs to be taken to select people who are both motivated and sensitive to others. It also points to the fact that people will not contribute their best if they are not rewarded appropriately for their efforts. The literature contains many examples in which the people who were supposed to be the prime implementers in the field were given grossly inadequate rewards. In India, for example, the extension workers who were to provide technical assistance for small-scale industries

> usually occupy a rather anomalous and ill-defined position in the state service, with extremely low rates of pay and few opportunities for promotion. In terms of both their physical location and their lowly position in the hierarchy, they are so remote from the centres of decision that they have little influence in obtaining [help] for rural industrial units. (12)

Prosser makes a similar observation regarding the special teachers employed by the residential youth camps in Jamaica (13). Grabe describes an even more desperate plight for the teacher in the Rural Education Centres of Upper Volta:

> The lone teacher in the village REC is expected to supervise and carry out instruction, manage a profitable school farm, account for the produce, organize school cooperatives, act as local *anima-*

> *teur*, form a liaison with the village leaders—both to gain their assistance in running and maintaining the school and its equipment and to reciprocate by providing services to the village. In return for this variety of heavy duties he would be paid only half the salary of his counterpart in the primary school, have a more limited security of job tenure, and almost certainly have inferior housing. These conditions have made it difficult to recruit and hold good quality staff, and the poor morale in the REC structure and teaching services has led at its worst to fraud and absenteeism, and at its best to an unending uphill struggle for the rural teacher whose enthusiasm is difficult to sustain. (14)

Bhola, who dwells at length on personality issues in his case study of an Indian literacy project, puts forth the following interesting hypothesis:

> A most interesting relationship seems to emerge between personality and organizational structures. In this case, some events cannot be explained except in terms of the personalities of the protagonists and their psychological needs. The personality-organization interaction seems to suggest that, where organizational structures are weak or dysfunctional, personality characteristics acquire greater importance.

He further hypothesizes:

> The more diffused the organizational form and objectives and the greater the uncertainty surrounding the enterprise, the greater the likelihood of attracting the professionally outcast. Generally, these are people who learn to get rewards from a benefactor out of charity. They develop a peculiar 'receiving-end' mentality and acquire techniques of staying at all costs. They lose all sense of the program objectives or the institution they come to serve but spend most of their time maintaining themselves and guarding their interests in the foreign enclave of their habitation. (16)

Bhola also paints portraits of the zealous founder, and the insensitive technocrat, the power hungry and the academic, all contributing in turn to a chaotic and ultimately failing enterprise.

In some cases, the best solution may be collective dedication to a common goal. Again, ACPO serves as a positive example.

> ACPO maintains that the major problem of underdevelopment is not the lack of material things, but in the inability of the campesinos, individually and collectively, to overcome their backwardness and to conquer cultural obstacles related to such traditional attitudes as a high degree of conformity, fatalism, and dependency. The campesinos are thus trapped by outmoded attitudes and this entrapment is reinforced by external conditions in the world around them.
>
> In the view of ACPO, if the attitudes of the mass of the rural peasantry can be altered to fit overall development objectives, one of the major barriers to social and economic development will be removed. (17)

Brumberg later explains this point further:

> Getting individuals to volunteer apparently requires a strong motivational and inspirational message. Potential volunteers must believe that their efforts will be of value to themselves and their community. The possibility that such volunteers may be selected for special training at one of ACPO's institutes and that further promotion may be anticipated may encourage individuals to volunteer. (18)

At this point it may be useful to recall what was said in chapter III, regarding the likelihood of personality conflicts emerging out of the 'grandeur' alternative. When great expectations are not being met, there is an increasing tendency to place the blame somewhere, often on individual people. These same people may be placed under great stress by the unrealistic demands of the project and hence they are more likely than otherwise to reveal those failings of personality for which others attack them. Again there is a vicious circle: system failure begets personal failure which is then blamed for system failure.

Barrier Factor III: underdevelopment

We suggested that Factor I was something that innovation planners could do something about and that Factor II was at least in part a result of Factor I failure. Factor III, on the other hand, may be a summary of those elements of frustration about which very little can be done, which might be labelled 'under-development'. This syndrome includes the familiarly dismal elements of very low per capita income, minimal foreign exchange, minimal or unknown natural resources, often long distances and harsh climate, poor roads and communications, minimal governmental, economic and educational infrastructure, much of it vestigial from a colonial past. The items from our survey which formed this cluster are presented in Table 8.5. Collectively, they account for 9 per cent of the total variance. On the other hand, seven of these items received 'serious' ratings from over 50 per cent of our sample, making this by far the strongest factor in this sense. (No other factor produced *any* item with a 'seriousness' rating greater than 50 per cent.)

Table 8.5. Barrier Factor III: Underdevelopment (inadequate resources and capacities).

Item	% Rating as 'serious'	Loading (Degree of relationship to this factor) (100 = highest)
a. Slow transport of materials	69	.70
b. Materials for the project were not ready or not delivered on time	57	.66
c. Costs were generally underestimated even without considering the effect of inflation	37	.57
d. Colonial education system was very inappropriate for needs of the country	67	.57
e. Persons who should have been involved in the project (as trainees or in other capacities) were difficult to locate and recruit	59	.55
f. Inflation threw original cost estimates completely off	51	.52
g. Colonial rule left the country very suspicious of foreigners	26	.45
h. Long distance between places	51	.44
i. There was a lack of skilled manpower to implement the project as planned	53	.46
j. The departure and replacement (turnover) of key persons in the project happened too quickly to preserve continuity	25	.41

Of all the elements which constitute 'underdevelopment', none is more salient than the inadequacy of transportation (i.e. in terms of chapter II, a lack of connexions, both internal and with the outside world). The authors of the Unesco report on the Experimental World Literacy Programme note the importance of this as a 'two-tiered' problem, i.e. first getting materials to the country, and second, internal distribution. The first tier was discussed as follows.

> Administrative as much as geographical, delays were often inordinately long. In one case, more than a year elapsed between the purchase of books and their delivery. In another, no less than twenty-three months went by between the decision to buy a bibliobus and its arrival at the project. Production of printed material in Madagascar only began after a foreign-bought printing press arrived, toward the end of the project. In only a few countries was there a coherent effort to

> develop national publishing activities which would lead to self-supporting and continuous book production and distribution. (19)

The second tier of distribution within the country was even more problematic:

> It almost always involved the distribution of goods (whether purchased abroad or nationally) from a major city–capital and/or port–to inland zones where the subprojects were located. Here again there were long delays. In several countries lack of transportation was a major problem hampering the promotion of adult literacy. Madagascar, where no EWLP zone was closer than 800 kilometres to project headquarters, had no infrastructure for distributing equipment and materials. Certain classes were several days' travel from even provincial capitals. (19)

Similar problems are reported in practically every case study of innovation in developing countries, e.g. those reported in Ponsoien on African countries and those reported in Ahmed and Coombs on a world-wide sample of nonformal projects.

Connexion is, of course, only one element in the cycle of underdevelopment; another is the reality of poverty, itself nowhere more clearly depicted than in Grabe's Upper Volta case:

> A rural education program, especially one of a practical nature and designed to bring about improvement in rural living conditions, cannot be viewed in isolation from the overall rural development effort. The Upper Volta farmers, burdened with poor farm land, entirely dependent on the vagaries of the weather for their next harvest, and always concerned about producing enough food for survival before taking chances with untried methods, need far more help than just knowledge of new agricultural techniques. In a situation where the animal-drawn plough is virtually an agricultural revolution not because the farmer does not know its value, but because he cannot afford the price of the plough and the animal, the villagers can be justifiably skeptical about a program to teach better farming practices unless the program is linked to an overall attack on the obstacles to poor farming. (20)

Poverty and underdevelopment of the country as a whole will also drastically affect the type of people who can be recruited to implement a project. As is clear from Factor II, regardless of how good an idea may be, innovation efforts can be frustrated if the wrong people are employed to execute it. Sometimes, as in the Upper Volta Rural Education Centres and the Indian small industry project, the rewards for service are simply set too low. But even where the rewards are high, there are still severe problems in a poor country, as Bhola points out very clearly:

> In an economy of scarcity with considerable educated unemployment within the system, hiring often comes close to a distribution of patronage. This fact of organizational life gives rise to particular patterns of institutional policy-making and styles of administrative behaviour. Complicated rules are made with regard to ensuring equal opportunity and objective choice. However, these rules only accomplish the diffusion of responsibility for recruitment decisions and often wrap nepotism in procedural justice. At the India Education Project, the interview boards were second-guessed in almost every case, and the organizational elite ended up destroying their blueprints for the institution's future by hiring the wrong people. (21)

Overcoming or coping with the underdevelopment barrier. It might well be asked if anything can be done about this factor other than recognizing its grim reality. Actually, there are some authors who feel strongly that it is no handicap. Orata, for example (op.cit., p. 68) claims that lack of equipment can be a blessing in the development of the barrio high school since it requires students to improvise with whatever they have, thereby learning the bases of modern technology without becoming dependent upon supplies of complex technical equipment and paraphernalia from the developed countries. Orata likes to cite as a model the fact that in the Swiss tradition of training watchmakers, the students begin by learning to make their own tools for making watches. In such a system, all elements in the process of technology are completely understood from their roots and none is mystified. The authors of the

Experimental World Literacy Programme report make the same point in criticizing the two-tiered strategy mentioned earlier.

> Viewed from a grass-roots standpoint, the two-tiered system of logistics made class members, instructors and supervisors – that is, the primary elements in learning and teaching – doubly dependent on external factors over which they had little or no control. For much of their supplies and equipment, they depended on national project headquarters, which in turn depended on foreign sources, both for materials to be trans-shipped to classes and for equipment with which to produce materials for shipment to classes.

This leads the authors to one of their main points of criticism regarding this worldwide development effort.

> Curiously in a programme that publicly stressed its adaptability to diverse conditions, EWLP was not notable for stimulating the imaginative use of locally available materials and facilities, or the equally creative local generation of import substitutes when materials were not available. There were some interesting exceptions. In the United Republic of Tanzania, as a matter of policy, literacy instructors were trained to use sticks and pebbles to demonstrate certain arithmetic concepts, but, on the whole, EWLP did not actively encourage such inventiveness. It tended instead to prefer the routine kinds of classical technical assistance. (22)

These points are also in line with the theory of British economist E.F. Schumacher. He notes four requirements for a 'regional' approach to development in the poorest countries:

> First, that work places have to be created in the areas where the people are living now, and not primarily in metropolitan areas into which they tend to migrate.
>
> Second, that these work places must be, on average, cheap enough so that they can be created in large numbers without calling for an unattainable level of capital formation and imports.
>
> Third, that the production methods employed must be relatively simple, so that the demands for high skills are minimised, not only in the production process itself but also in matters of organisation, raw material supply, financing, marketing, and so forth.
>
> Fourth, that production should be mainly from local materials and mainly for local use. (23)

Barrier Factor IV: financial problems

It is noteworthy that, in our statistical analysis, financial aspects of the process of innovation (Factor IV) are separate and distinct from underdevelopment in general (Factor III) although both receive fairly high 'seriousness' ratings. The point here is that a project can be hamstrung from poor financing and from unfavourable economic conditions *per se* as a primary cause irrespective of unfavourable geography, illiteracy, lack of resources, and feeble infrastructure. Upper Volta is again a prime case in point:

> While any realistic program for rural education must take advantage of all cost-saving opportunities and make efficient use of available and new sources of support, it obviously must have basic resources that are commensurate to the tasks it is expected to perform. If the program can engender community support, the financial burden on the government can be partially reduced. In the case of REC, government financing has been inadequate and community support has lagged, in part because of a lack of popular enthusiasm for the program, but also because of the crushing poverty of the Voltaique rural families. (24)

There also appears to be a vicious circle here: inadequate government support breeds inadequate local support; low success in turn leads to government disinterest which leads to even lower government support.

Table 8.6 shows a relationship between dissatisfaction with national financing and with international financing (r = +.54). However, the dynamics of project financing will not be dealt with extensively here as they have already been well covered in chapter VI.

Regarding the solution of financial problems, the answers may be easier than their implementation. To some degree all innovation projects are under-financed. There is the hidden expectation in many that a great deal can be accomplished with very little money if the innovators have a very good idea and are very clever in finding various so-called 'multiplier effects'. It may be needless to point out that there are limits to such assumptions.

TABLE 8.6. Barrier Factor IV: financial problems

Item	% Rating as 'serious'	Loading (degree of relationship to this factor) (1.00 = highest)
a. Inadequacy of level of financial support contributed by the country	50	.74
b. Inadequacy of level of financial aid from outside the country	42	.65
c. The economic condition of the country as a whole	48	.64
d. National economic priorities were on other areas than education	22	.63
e. There were significant delays in the delivery of funds	24	.54
f. Inflation threw original cost estimates completely off	51	.51

Within the realm of the possible, the ACPO project in Colombia has probably gone as far as any innovatory scheme in achieving local and national financial independence.

> The organizational objective of self-financing a substantial portion of expenses appears to have had an interesting effect upon the institution. It has resulted in a greater awareness of program budgeting and planning. There also seems to be a greater cost of consciousness than would normally be found in an educational organization and considerable pressure exerted to reduce program costs wherever possible. Maintenance of equipment and inventory control, which were noted above, are examples of attention to costs and the general business-like attitude found within the organization. (25)

Brumberg also gives details of how this principle applies to various aspects of the ACPO project. For example:

> ACPO's educational materials are printed by Editorial Andes, which ACPO owns. One of the five largest printing firms in Colombia, Editorial Andes employs approximately 130 persons. Commercial work constitutes about 75 per cent of the Editorial Andes plant's traffic, and the profit from such work, which is undisclosed, goes into the general ACPO budget.
>
> The plant is well equipped to do almost any kind of printing job, from calendars and labels to comic books and financial reports. Its equipment, much of it donated, includes both letterpress and offset equipment and an extensive photo-engraving department capable of doing fine quality color separation. (26)

There is still a question, however, as to whether ACPO's principles apply at the level of the campesinos themselves. Obviously, Editorial Andes is a fairly large operation which is national in scope, not regional or local. Hence it does not conform very well to the micro-economic principles enunciated by Schumacher.

We regret that our own lack of expertise in economics prevents us from probing this important area much further. We hope, however, that our analysis has been successful in bringing economic variables into relation and perspective with the many other factors involved with educational innovation.

Barrier Factor V: opposition from key groups

We are not surprised to find a specific factor having to do with opposition to change *per se*. As can be seen from Table 8.7, this factor is best described by the single item, 'ruling élites. . . opposed to innovation'. Once again it is important to observe that this set of items is relatively independent of the other sets, suggesting that resistance to change needs to be considered separately from resistance due to financial constraints, realities of underdevelopment, personalities and systemic factors.

TABLE 8.7 Barrier Factor V: opposition from key groups in society

Item	% Rating as 'serious'	Loading (degree of relationship to this factor) (1.00 = highest)
a. Ruling élites traditionally opposed to innovation or to expansion in education sphere	26	.71
b. There was conflict among ideologies about change	30	.54
c. The project was implemented too slowly	23	.53
d. Colonial rule left the country very suspicious of foreigners	26	.42
e. Objections to project by special interest groups	17	.39

One example of how an innovative project can be totally frustrated by traditional forces is provided by Solarin's account of the Mayflower School in Nigeria:

> The government had no hand whatsoever in the Mayflower innovation. In fact, the government was hostile because it had to reckon with a school that was doing most things contrary to the ways that the civil service laws, the General Orders (irreverently referred to as the civil service Bible) expected. It tried, to start with, to stop the school from being co-educational. The life in the school was too primitive, it said, to qualify to take girls in. When we overcame this difficulty, the government openly declared that the type of physical exertion to which the children were exposed could not make it possible for them to acquire enough knowledge to sit for the West African School Certificate Examination, a public examination. When the government would not budge, we made a quiet arrangement and took the children to Ghana to participate in the 'O' level examination of the General Certificate of Education. The change of government that occurred, however, was favourable to the school. Financial aid of any consideration did not come in until this change. (27)

In many cases, the seeds of resistance to change have actually been sown by the colonialists who long ago installed a rigidly inappropriate European model of education which some of the people now cling to. Hakemulder discusses the problem in connexion with the reform of primary teacher training in Kenya.

> However, if we try to give the school supervisors freedom to change the curriculum more in the direction of the country's needs, we can be sure that most parents will be disappointed and will want the educational system as it developed in colonial days. For instance, the introduction of agricultural science and more handicrafts will be very difficult for the parents to accept. (28)

The irony is compounded by the fact that the *leaders* of the innovation project are often products of the same system and therefore inherit many of these same resistant attitudes.

In some countries truly innovative projects have been launched, but in the end they have been absorbed by the conventional system because of the resistance to change from within (the people responsible for promoting change are, themselves, products of the school system) and from without (parents think diplomas have magical powers). (29)

Barrier Factor VI: poor social relations

The last factor which we chose to extract from this analysis is also the weakest and explains the smallest amount of variance (5 per cent). It is best represented by two items (relations inside the innovation team and relations with outsiders) which are highly correlated with each other (r = +.81) and are also quite highly related to items on Factor II and less so with items on Factor I (see again Table 8.2). The content of these items strongly suggests that the primary underlying dimension is social or interpersonal relations. It was seen, in analysing Factor I in particular, how poor project planning and, in Factor II, poor staff selection, lead to conflict between people. In Factor VI, some of that conflict may still be there even when those other two factors are taken care of. Put another way, there is some point in working to improve interpersonal communication and harmony regardless of these other factors.

TABLE 8.8. Barrier Factor VI: poor interpersonal relations

Item	% Rating as 'serious'	Loading (degree of relationship to this factor) (1.00 = highest)
a. There were problems in social relations between team members and others	17	.66
b. There was inadequate social harmony and good relations among project team members	22	.63
c. There was poor climate for sharing ideas openly	23	.59

Summary

In this chapter we have tried to review a very large range of issues that are frequently cited as barriers to educational innovation. We began with a list of 67 items derived from seven broad topic areas: geography, history, politics, socio-cultural phenomena, economics, psychology and procedures. A straightforward analysis of the 'seriousness' ratings by our respondent sample of 81 project directors and technical advisers from over 40 national projects in different developing countries indicated that items relating to geography, economy and history, essentially those variables which define 'third world' to most observers, ranked highest in seriousness, followed by the more purely financial variables.

However, a more complex analysis of our data, utilizing the techniques of correlation and factor analysis, revealed six underlying dimensions of Barriers. The first and most important dimension focused on *inadequate planning*, failure to take into account the nature of the system into which the innovation is being introduced. The cluster of problems attached to this factor reminded us strongly of the 'alternative of grandeur' which was described in chapter III as one of the predominant patterns of innovation and one of the most dysfunctional.

A second barrier factor related to the disruptive effects of individual *personalities* which resulted from inappropriate selection of personnel to lead and implement projects and from inadequate and inappropriate *motivations* and rewards.

A third factor was strongly connected to the very fact of *underdevelopment*, particularly to such items as poor transportation systems and feeble technical infrastructures which made it inordinately difficult to find and recruit the right people and to deliver needed materials. A fourth factor, somewhat connected to the third but distinct, was related to the level of *financial* support and to the economic condition of the country.

A fifth factor was related to the opposition to innovation in general and particularly *opposition from ruling élites* who have a stake in the 'old order'. It is necessary to recognize that there may be serious conflict between differing ideologies of change, some favouring gradualist and decentralized approaches while others favour revolutionary, populist and national approaches. The status of Unesco and other non-political international aid and development organizations in such conflicts is obscure.

Finally, we noted the presence of a somewhat weaker factor associated with difficulties in interpersonal relations.

Noting that most of these factors were correlated with each other, we suggested the possibility of certain causal connexions among them. In particular it seems likely that poorly planned projects with grandiose objectives ('alternative of grandeur') will lead to all kinds of bureaucratic entanglements, confusion, and lack of political support (Factor I). This in turn will undermine the motivation of key personnel (Factor II), turning them against each other (Factor VI).

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CHAPTER NINE

Strategies of innovation

The previous chapter noted that there are various ways in which the material in this book could be organized and summarized. One approach is to analyse steps in the process from planning to implementation and dissemination. Chapters IV, V, VI, VII and X have been organized in that fashion. Another way is through an analysis of 'barriers', i.e. the places where projects are likely to go wrong or the kinds of difficulties which they might encounter, and that was the emphasis of chapter VIII. Now still another form of analysis will be attempted with the focus on what people deliberately *try* to do to make a project succeed. At the level of day-to-day detail there may be no discernible pattern other than to say that people did their best when placed in this or that circumstance; they were 'pragmatic', 'idealistic', 'deliberate', 'confused', or whatever. However, when one steps back a few paces and looks at a multitude of actions over a period of time one may begin to discern a distinct pattern of effort which could be referred to as a 'strategy'.

Already in chapter III we have made an effort to look at project patterns from the point of view of our theory of systems. Here, however, we are more interested in the self-espoused action theories of innovators themselves. These might be called the 'ideologies of innovation', although in most cases they are not as clearly articulated or as well-grounded in philosophy or history as such a label implies. On the other hand, we are above the level of the cookbook which metes out specific formulas for specific situations. Such an analysis might be called 'a tactical guide to innovation'. Any such guide, however, would have to be written from a point of view, a perspective on the total process of change in systems. We are convinced from our readings and from our analysis of information from several sources that there are a limited number of such perspectives which dominate the thinking of innovators and their advisers. Some of these perspective are complementary; some are largely contradictory. Some are clearly thought out and well-articulated; others are confused and vague. In this chapter, we will try to group the major perspectives or strategies, by combining data from our various sources but relying heavily on information from the questionnaire which very strongly confirms patterns derived from past research on this topic. We will also provide as much information as possible to tie these major strategies to other variables in the survey. Finally we will discuss the relationship between these strategies and the broad project patterns which we saw emerging from chapter III.

BACKGROUND

In 1969 Havelock first reported an analysis of the literature on planned change and innovation in which he discovered three predominant patterns or 'perspectives' which he labelled 'Research, development, diffusion', 'Social interaction', and 'Problem-solving' (1). Each perspective was derived from a multitude of sources and represented by the works of at least eight recognized theorists and prominent researchers. In

1973 Huberman used the Havelock formulation and extended it to reach an international audience in his monograph for IBE-Unesco (2). In 1973 Havelock reported confirmation of the configuration of three perspectives toward innovation in his study of innovation patters in 350 school districts in the United States (3).

Working quite independently, but using a similar methodology, Chin and Benne (4) derived three broad clusters of ideology regarding change which they labelled 'rational-empirical' (similar to Havelock's RD & D but adding elements of the Social interaction perspective), 'normative-reeducative', (similar to Havelock's Problem-solving), and 'power coercive' (essentially different from any of Havelock's formulations). Dalin adapted and employed the Chin-Benne formulation to analyse a series of European and North American cases of educational innovation at different levels (central, regional, and school) (5).

For our present study, we decided to combine elements of the Havelock and Chin-Benne formulations and to generate a large set of questions related to several possible 'perspectives' or 'strategies'. The method followed was essentially the same as for the barriers analysis described in the last chapter. We decided upon six major categories of questions:

1. Locally participative and responsive problem-solving and self-help strategies (Havelock's Problem-solving);
2. Power, authority, administrative, and legalistic strategies (Chin and Benne's Power-coercive);
3. Strategies emphasizing openness, flexibility, eclecticism (i.e. no particular theory), and multiplicity of inputs (a position which derived from Havelock's 1973 data);
4. Strategies emphasizing communication and diffusion of innovations through various channels and interpersonal networks (the social interaction perspective);
5. Systematic research-oriented and evaluation-controlled approaches (Havelock's RD & D perspective); and
6. Approaches which emphasized inside-outside co-operation, and dialogue (offered by Havelock as a 'linkage model' to bring together positive elements of other perspectives).

Five items were generated to typify various aspects of each viewpoint and the total set of thirty items was offered to our expert sample of 81 teacher training project directors and chief technical advisers. They were asked to indicate the extent to which each item received 'emphasis' in their particular project. The wording of the over-all question was as follows:

9. What was the Strategy of Innovation? It is very difficult to provide a satisfactory summary of the strategies and operational philosophies of so many diverse projects. However, many of the following items have been recommended by various experts as important elements in a sound strategy of innovation. Which elements received emphasis in your project?

The item-by-item checklist was presented as follows:

		Emphasis				
		Extreme	High	Moderate	Little	Actively discouraged
9.33	Use of research; systematic retrieval of information	☐	☐	☐	☐	☐
9.34	Evaluation in quantitative terms	☐	☐	☐	☐	☐
	etc. . . .					

Item responses (about 85 per cent of respondents answered all items) were then tabulated and intercorrelated. The resulting matrix of correlations was subjected to a principal axes multiple factor analysis from which the largest six factors were extracted. This factor matrix was then rotated using the varimax method as with the barrier items reported in chapter VIII. What resulted were five very distinct clusters or 'factors' which accounted for 58 per cent of the total variance among the original 30 items.

We were surprised and pleased to find that these clusters conformed in large part to our original expectations. The data analysis reveals a distinct and strong factor associated with the 'problem-solver' perspective and another which strongly suggests the 'social interaction' or 'diffusion' perspective. A third fits very clearly with the 'power-coercive' strategy proposed as a major historical theme by Chin and Benne. A fourth clear cluster, somewhat related to the first, could best be described as an advocacy of a very wide open and flexible approach to change. A fifth factor seems to connect Havelock's earlier 'linkage' formulation with ideas which we have stressed throughout this book concerning the need for specific and detailed planning for the implementation of innovations.

OVERVIEW OF RESULTS

The first point which should be made concerning these findings is that they do not describe patterns which *are* most effective in managing innovations but rather *beliefs* about which patterns are *best*, either because they are most effective or most valuable or most acceptable on ideological grounds. Hence the present analysis is completely separate from that made in chapter III. The fact that 'participative problem-solving' is the most highly endorsed strategy probably suggests a combination of value judgements about what is right, practical judgements about what is possible, shrewd judgements about what is most acceptable and diplomatic to say, and empirical judgements about what really works.

We are also faced with a problem of communication; we have more data to report than can be contained within this kind of publication. Therefore a very complex assortment of findings must be reduced to a much smaller set, in the process losing much of the detail which we feel must be there to give the fairest and most objective presentation. Factor analysis helps us to go through such a data reduction in a somewhat objective way. But factor analysis does not remove the subjective element and at the same time introduces new distortions. Table 9.1, which presents our analysis in its most summarized and abridged form, exemplifies this problem. First of all, we are faced with the problem of fair labelling: we have tried to select a descriptive statement for each factor which makes common sense and does not deviate too far from the statistical evidence. However, the careful reader should also consult the precise wording of the items as they are presented in subsequent tables to realize that we have taken some liberties here for the sake of smooth presentation. The second note of arbitrary judgement enters in the matter of ordering: what makes one factor more important than another and what considerations lead us to place one before another, thereby implying greater significance? We have ordered these five factors by juggling at least five considerations: the amount which they explain of the information in the correlation matrix (percentage of total variance), the extent of importance or 'emphasis' ascribed by the respondents, the clarity or 'purity' of the cluster (the extent to which items in a set are highly related to each other and minimally related to other items outside the cluster), the logical relatedness of the clusters, and, finally, the degree to which we, the authors, feel there is meaning or clarity of presentation in the way they are offered.

TABLE 9.1. Summary of Strategy Factors

	Summary description	Variance explanation %	High emphasis* %	Correlation to other factors I	II	III	IV	V
I.	Participative problem-solving Innovation should be: controlled by local people, responsive to their needs, and emphasize local resources and self-help.	16.5	65	–	.73	.39	.46	.53
II.	Open input Innovation should be broadly and flexibly designed to make maximum use of all ideas and resources from inside and outside.	9.3	64	.73	–	.43	.56	.63
III.	Power Innovation should be clearly directed from above, using laws, formal procedures, a chain-of-command and designated agents for technical assistance.	10.5	36	.39	.43	–	.28	.31
IV.	Diffusion Innovation should be spread through maximum use of media and informal networks of opinion.	11.7	35	.46	.56	.28	–	.60
V.	Planned linkage Innovation should be carefully planned, based on clear and realistic objectives, dialogue between innovators and all relevant others, and high sensitivity to the user's actual situation.	9.8	61	.53	.63	.31	.60	–

* This figure represents an average of the percentage of 'high' and 'extreme emphasis' ratings for the five items under each factor with strongest loadings.

It should be noted from Table 9.1 that Strategy Factors I and II are highly correlated with each other ($r = .73$) despite the fact that they are distinct clusters both statistically and conceptually. Both are also highly popular strategies with our respondents, receiving a heavy majority of 'high' and 'extreme emphasis' ratings. Factor V is also fairly highly related to both I and II and is also quite popular, but it is listed as fifth because it is more complex conceptually and less distinct statistically.

Factor III stands out as being far less popular and having the lowest correlations with the other factors although all correlations are positive and statistically significant (probability that the true correlation = zero is less than .01 in all cases). Factor IV is also relatively less popular but constitutes a significant divergence of opinion (nearly 12 per cent of total variance).

TABLE 9.2. Strategy Factors: Item clusters and their loadings showing independence and overlap of factors

	Varimax rotation (loadings above 0.25)					Percentage rating 'High' or 'Extremely High' emphasis
	I	II	III	IV	V	
Factor I Participative Problem-Solving						
Local control, participation, decision-making	.78	–	–	–	–	.70
Responsive to local customs, needs, desires	.75	–	–	–	.33	.72
Wide latitude for individual initiative and choice at the local level	.74	–	–	–	.32	.47
Self-help: belief that people ought to be able to solve their own problems with minimum outside assistance	.73	–	–	–	–	.65
Maximum use of local resources	.65	–	–	–	–	.72
Factor II Open Input						
Openness to recycling the project, redefining goals and procedures	.26	.70	–	–	.28	.63
Broad definition of goals	.44	.65	.29	–	–	.66
Maximum use of all resources, national, local, and outside	.48	.48	.41	–	–	.64
Search for new ideas from as many people as possible	.59	.47	–	–	–	.64
Factor III Power						
Clear administrative hierarchy for decision-making and implementation	–	–	.70	–	–	.46
Use of directives, laws, rules, procedural manuals	–	–	.66	−.26	–	.41
Negative sanctions for failures to conform to project procedures or to meet specified objectives	.33	–	.63	−.36	–	.20
Involvement and direction by top political leadership	–	–	.49	–	–	.40
Special agents for communication or technical help	–	–	.51	.39	–	.35
Factor IV Diffusion						
Use of informal channels	–	–	–	.73	–	.32
Identification and use of formal and informal leaders of opinion	–	–	–	.70	–	.40
Techniques of persuasion	–	–	–	.69	–	.42
Planned use of mass media to create awareness of the innovation	–	.30	.33	.59	–	.30
Sub-groups for research, planning, development, and dissemination	–	–	.43	.53	–	.32
Factor V Planned linkage						
Use various feed-back procedures	–	–	–	.35	.61	.65
Joint funding - national and international	–	–	–	.33	.59	.62
Understand user's actual situation	.29	.37	–	–	.58	.74
Careful specific planning	.33	–	.41	.29	.57	.56
Clear definition of objectives	.41	.34	.29	–	.51	.61
Two-way dialogue between project and others	.28	–	–	–	.37	.48

What should also be clear from Table 9.1 is that all strategy factors are correlated with one another. This may be partly an artifact of the questionnaire design: all items were keyed in one direction, perhaps encouraging many respondents to develop an 'agree' response set. However, it also seems likely that most of the specific approaches or orientations were agreeable to most respondents since they did not involve any inherent contradictions and did represent views which are widely espoused in the literature. There may even be a kind of ideology of innovation which says 'Let's try anything and everything, being as open and as pragmatic as possible, using power and law where need be, and informal influence and persuasion where they can be used'. This 'all strategies' view may best be characterized by Factor II which is most highly correlated with all the other factors.

To give a more complete picture of the results of the factor analysis, we provide Table 9.2. This lists all the items which related strongly to the five factors, together with their loadings on all five factors. Loadings below .25 have been suppressed in order to illustrate the factor structure more clearly. The purity or clarity of a factor is illustrated by the number of high loadings restricted to one column, together with the small number of high loadings in any other column. It is evident from this table that at least three of the factors are very clear indeed: I, III and IV. This result conforms with the formulations of Havelock (1969) and Chin and Benne (1969) which were based on extensive reviews of the literature on change and innovation.

The remainder of this chapter will be based on Tables 9.1 and 9.2 but will treat each factor separately. Therefore, the reader may wish to refer back to these tables in order to retain an overview of the factors, their interrelations, and how they were derived. Table 9.2 paraphrases the wording of 25 items from our original list of 30. One additional item was discarded because of an error in the original typing of the questionnaire which was not detected before it was administered. Thus, there remain four items from our original list which do *not* fit clearly under any of the five factors in Table 9.2. These are listed together with factor loadings and 'emphasis' rating in Table 9.3. For this table we have included all loadings above .20 in order to emphasize the complexity of interpretation.

TABLE 9.3. Strategy Items which are relatively independent of the five major strategy factors

Item	Extreme or High emphasis %	Factor Loadings >.20				
		I	II	III	IV	V
Strong adherence to specified national development goals	73	.47	.44	.24	–	.27
Use of many media and many procedures for participation	56	.49	.29	.25	.40	–
Use of research; systematic retrieval of information	41	.35	.38	–	.34	.30
Evaluation in quantitative terms	38	.22	.28	–	.29	.25

The first of these items is the second most strongly endorsed of all 30 items in the set, and therefore probably deserves separate recognition. It also has fairly high loadings on both Factors I and II despite an evident contradiction, i.e. how can one emphasize local autonomy and flexibility of goals and at the same time adhere strongly to national goals? It is possible, of course, provided that the national goals include local autonomy and self-help on the one hand and are broad and flexible on the other. We had included this item with the expectation that it would fit with the 'Power' factor (III) but clearly it is not interpreted in that way by the majority of our respondents.

The second and third items listed in Table 9.3 are probably here because of poor wording, leading to double interpretations. Use of media fits with Factor IV but participation goes better with Factor I, despite what we feel is a logical and functional connexion between the two (see again chapter VII). Likewise, the use of research and the retrieval of information may not be seen as fitting clearly together. It should also be pointed out that this item was designed to fit with an 'RD and D' factor which failed to emerge from our analysis. Likewise the last of these residual items on 'quantitative evaluation' was supposed to fit with such a factor. This item is quite independent of all the others; indeed, if we had carried our analysis to a sixth factor, this item would have emerged as its leading descriptor.

We are now ready to turn to a more detailed analysis of each of the main factors, using, where possible, references and quotations from sources other than the survey itself.

STRATEGY FACTOR I: PARTICIPATIVE PROBLEM-SOLVING

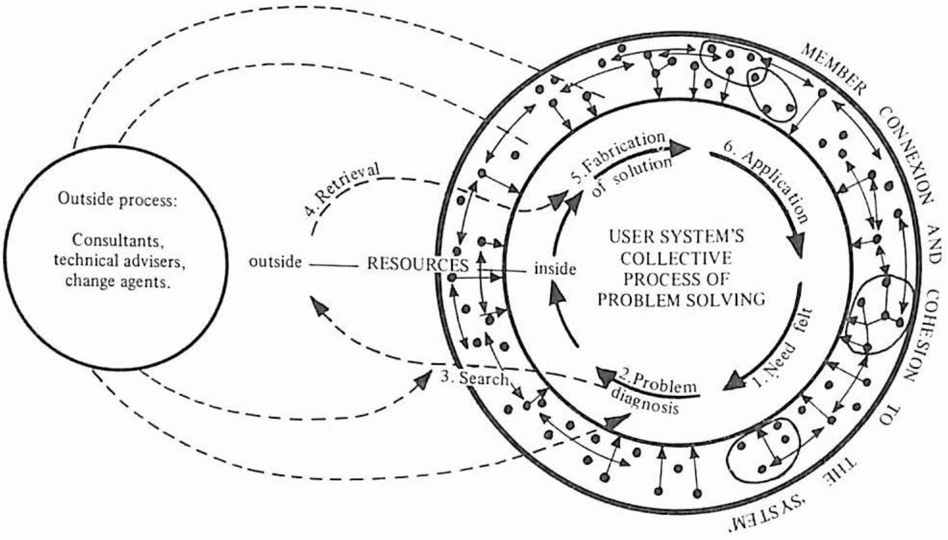
It has become very fashionable in recent years to emphasize the importance of local initiative, responsibility, and self-help as the driving force of national development. The fundamental idea, which is accepted in principle in most of the cultures of the world, is that 'development' is intended to serve the needs of the people as a whole, individuals, families, communities, and so forth. If development does not fulfil the needs and aspirations of the people it has no meaning. Building on this idea, the strongest adherents of the 'problem-solving approach' say that the people have within themselves most if not all the ideas, resources, and energy to bring about change. Outsiders may play some kind of facilitative role with temporary infusions of aid or technical assistance but such inputs are seen as mostly peripheral to the real change process.

There is a further assumption that innovation is only a part of a continuous problem-solving process which is going on inside the 'user', i.e. the community, the family, and the individual. This 'problem-solving' consists of a sequence of activities beginning with a *need*, sensed and articulated by the user, which is translated into a *problem* statement and *diagnosis*. When he has thus formulated a problem statement, the user is able to conduct a meaningful *search* and *retrieval* of ideas and information which can be used in formulating or selecting an *innovation*. Finally, the user needs to concern himself with *adapting* the innovation, *trying out* and *evaluating* its effectiveness in *satisfying* his original need. The focus of this orientation is the user himself, his needs and what he does about satisfying his needs. The role of outsider is therefore consultative or collaborative. The outside change agent may assist the user either by providing new ideas and innovations specific to the diagnosis or by providing guidance on the process of problem-solving at any or all of the indicated stages.

Figure 40 suggests some of these dynamics. The 'user system' is a world unto itself; outside resources and outside agents are relatively peripheral and unimportant to the main task. What *is* important is first of all to bring the members of the so-called 'system' together so that they really are functioning as one unit, and, secondly, to evolve a process of problem-solving (see the discussion of procedural configurations in chapter III) which is optimally beneficial to all members.

If the 'user' is a group, an organization, a community, or in the extreme case, an entire nation, then the problem-solving strategy also puts great emphasis on group communication, the building of group or organizational self-awareness and cohesiveness and *collaboration* among the members of the user system in solving their problem with as wide a circle of participation as possible. The outer circle of Figure 40 is supposed to suggest this aspect of the strategy.

FIGURE 40. A model depiction of the participative problem-solving strategy


Outside process:
Consultants, technical advisers, change agents.
outside
RESOURCES
inside
4. Retrieval
3. Search
5. Fabrication of solution
6. Application
USER SYSTEM'S COLLECTIVE PROCESS OF PROBLEM SOLVING
1. Need felt
2. Problem diagnosis
MEMBER CONNEXION AND COHESION TO THE SYSTEM.

At least five points are generally stressed by advocates of this orientation: first, that *user need* is the paramount consideration and the only acceptable value-stance for the change agent; second that *diagnosis* of need always has to be an integral part of the total process; third that the outside change agent should be *nondirective*, rarely, if ever, violating the integrity of the user by placing himself in a directive or expert status; fourth that the *internal* resources, i.e. those resources already existing and easily accessible within the client system itself, should always be fully utilized; and fifth that *self-initiated and self-applied innovation* will have the strongest user commitment and the best chances for long-term survival.

Table 9.4 displays the five items which most strongly exemplify this factor in our survey together with the responses. Percentages are based on the number responding to the item. At the extreme right we also list the number of persons who did not respond to the particular item out of the total of 81 persons who returned their forms to us.

TABLE 9.4. Strategy Factor I: Participative problem-solving ratings by item

Item	Emphasis*					
	Extreme (%)	High (%)	Moderate (%)	Little (%)	Actively discouraged (%)	No Response (N =)
Maximum use of local resources	27	45	21	6	1	3
Responsive to local needs, customs, desires	22	50	19	8	0	9
Local control, participation, decision-making	26	44	21	8	1	8
Self-help: belief that people ought to be able to solve their own problems with minimum outside interference or assistance	26	39	23	12	0	12
Wide latitude for individual initiative and choice at the local level	15	32	35	14	3	16

* Percentage of those responding to the particular item. Each row = 100% + or − 1 point due to rounding.

The best statement of the fundamental philosophy of problem solving which we have derived from the literature is that of Orata in describing the basic approach to developing the barrio high schools of the Philippines:

> The only way to start is to start, and the place to start is right here with what little we have and with even a negative quantity. In every case we did not wait for experts to come, or for money to be appropriated, or for certain things to be done for us. Had we waited, we would still be waiting. Our only capital was ourselves, our health, our determination to succeed, and of course our own resources – land, artesian wells, canals and some shovels, and good humour. We did not have any budget. We studied our needs, made plans, and went ahead as best we could to achieve our objectives. (6)

Orata also stresses the group solidarity aspect of the problem-solving approach:

> Community health is everybody's business. If the people in the next lot use the open spaces near the fence as their latrine, it is the business of the people in the neighborhood if not in the whole community to take notice and do something helpful about it. Or, if there are stray pigs roaming around, we must not wait for the policeman to catch them. Again, if a family cannot dig the canal in front of their house, we should not fold our hands and wait until they can if we want the water to flow freely. We have adopted the policy that we should, as a community, or as groups of individuals, do something to help construct latrines, to catch pigs, to dig canals, or build dams with or without pay. (7)

The oft-cited ACPO project in Colombia, although it is national in scope and incorporates many different strategies, has a basic philosophy which fits the problem-solving perspective:

> ACPO maintains that the major problem of underdevelopment is not the lack of material things, but in the inability of the campesinos, individually and collectively, to overcome their backward-

> ness and to conquer cultural obstacles related to such traditional attitudes as a high degree of conformity, fatalism, and dependency. . .
> . . . if the attitudes of the mass of the rural peasantry can be altered . . .
> . . . one of the major barriers to social and economic development will be removed. In ACPO's terms, this "development from below" is a necessary precondition for national development. One may deduce from ACPO's stated position that development from above, from a central government or oligarchy, is counterproductive in that it reinforces the dependence, fatalism, and paternalism which serve at present as a brake on development. (8)

We also see in both the Brumberg and Orata quotations a strong repudiation of the 'power' strategy exemplified by our Strategic Factor III.

The authors of Unesco's report on the Experimental World Literacy Programme point out that this same problem-solving strategy is a basic principle of adult learning:

> In the school class, knowledge is transferred almost exclusively from the teacher to the taught. In contrast, several EWLP projects gave explicit recognition to adults' experience and insights as a valid starting point for learning.
>
> The sequence of the Guinean teaching contained no less than eight steps but began with group discussions. In Madagascar, the educational process also started with group discussion, during which participants analysed their technical problems and reviewed solutions. Only afterwards were these possible solutions grouped into key sentences as a support to literacy instruction. Lessons in Sudan began with the presentation of a problem in one of several ways (oral, filmstrip, etc.) after which learners were encouraged to pool their experiences and reach a group decision on the best solution. (9)

Yet the authors are rather critical of EWLP's success in implementing a user-centred strategy:

> Thus one of EWLP's basic tenets was 'the complete or partial assumption of responsibility for action by the socio-economic groups concerned'. This implied the creation of specific machinery for planning and implementing literacy that would take learners' views, problems and hopes into account. The almost universal absence of such machinery must be considered a failing of the programme.
>
> Along with Guinea, and to some degree Algeria, the United Republic of Tanzania appears to have provided for a measure of learner participation in managing – if not planning – its project through class committees. The committees were composed of a chairman, secretary and treasurer elected by each class upon its formation, as well as the instructor. Class committee decisions covered enforcement of participant discipline, the spending of money made from demonstration plots, and the scheduling of classes. In practice, classes often modified their schedule and this sometimes required additional government expenditure for additional hours of teaching. (10)

As Sheffield points out, however, there may be an inherent conflict between local initiatives and the efforts of governments and other institutions to promote innovation:

> As proponents of *Animation Rurale* in Senegal, *Ujamaa* villages in Tanzania and other grassroots, self-help programs have discovered, local initiative (the key to these approaches) does not always coincide with the aims of "assisting" institutions, both public and private. There is a fundamental conflict in any community development program between the policies identified by governmental or other funding agencies and the felt needs of the community. (11)

There are, in fact, countless references in the literature to the problem-solving strategy or some variant of it. The above quotations give some flavour of this literature but are not necessarily representative. The problem-solving perspective has also appeared elsewhere in our text under other guises, e.g. in chapter II we devoted considerable attention to the process by which a system changes itself. One could say that a systems approach such as that espoused in chapter II *is* a problem-solving approach. In chapter III we noted the apparent success of local innovation efforts in contrast to grandiose national schemes which had trouble adjusting themselves to individual and local needs and conditions. In chapter VI we noted the tendency on the part of many change theorists to emphasize use of local (proximate) resources to the exclusion of outside (remote) resources or *vice versa*. All these discussions are relevant to consideration of this strategic factor.

Correlates of Strategy Factor I

Yet another source of information pertaining to this factor should be noted. In addition to looking at relationships among the 30 strategy items, we looked for relationships between Strategy Factors and other items in the survey. Table 9.5 lists some of these relationships. Again one should be reminded that a correlation of .20 or greater indicates a relationship which is significantly greater than zero in 95 per cent of cases. The Factor I 'score' was derived by summing responses, subject-by-subject, of the five highest loading items, i.e. those that appear in Table 9.4. This sum score was then correlated with 42 other variables which had proved to be of interest. We have thus selected only the most highly correlated items from a much larger list to compose Table 9.5.

TABLE 9.5. Correlates of Strategy Factor I: Participative problem-solving

Item or variable	Correlation (r)
Barrier Factor VI Poor social relations	-.30
Barrier Factor I Underestimating the process	-.20
Objectives defined with outside help	-.37
Early replacement of outside finances	+.25
Early replacement of outside personnel	+.27
Originators of project were insiders	+.25
Size of national financial contribution	+.20
Sophisticated pattern of resource utilization (see chapter VI)	+.27
Use of politically-oriented media (large meetings, speeches, radio)	+.33

While the size of these relationships is not dramatic, they tend to confirm the overall pattern of self-reliance. Projects which stress a Strategy Factor I approach apparently report *fewer* barriers, especially at the interpersonal level but also in respect of bureaucratic entanglements and isolation from political power (B–I). These projects also reflect higher levels of national contribution and an early capacity to replace outside help with indigenous personnel and financing. We also note a willingness to use media and a variety of resources. Indeed, the number and variety of inter-relationships indicated in Table 9.5 is rather impressive and does at least hint at causal relations between the frequency of certain problems in innovation and the pursuit of this strategy.

STRATEGY FACTOR II: OPEN INPUT

We are not quite sure whether this cluster represents a strategy or simply the lack of one. There are certainly very few references in the literature to an explicit strategy of openness or flexibility. Nevertheless, that is what we appear to have here. In fact the pattern which we have found is very similar to a factor which emerged from a previous survey of 350 school superintendents in the United States reported by Havelock and Havelock (1973). The items which represent the factor are listed together with 'emphasis' ratings in Table 9.6.

The first and second items suggest a very pragmatic and perhaps opportunistic attitude toward innovation, casting aside ideologies and following the currently popular trends. While the idea of flexibility seems laudable, one wonders whether more anchoring is needed to allow a project to build solidly and have lasting, visible, and memorable accomplishments. We are also left wondering who controls the innovation, to what ends and to whose benefit?

TABLE 9.6. Strategy Factor II: Open input – ratings by item

Item	Emphasis*					
	Extreme (%)	High (%)	Moderate (%)	Little (%)	Actively discouraged (%)	No Response (N =)
Openness to recycling the project, redefining goals and procedures as circumstances change	25	38	23	12	1	8
Broad definition of goals	24	42	18	15	0	10
Maximum use of all resources, national, local and outside	27	37	22	14	0	8
Search for new ideas from as many people as possible	22	42	15	19	1	9

* Percentage of those responding to the particular item. Each row = 100% + or – 1 point due to rounding.

The third and fourth items in Table 9.6 may recall the discussion in chapter VI about the need to develop a sophisticated resource acquistion strategy which balances proximate and remote inputs. These two items again merely place a value on openness to all resources and ideas without the qualification of selectivity or balance and without recognizing the costs inherent in such openness.

There are some inklings from a few sources, however, that suggest that there may indeed be a strategy emerging from some of these ideas. The authors of Unesco's report on the Experimental World Literacy Programme suggest a principle of 'variety' as important in adult learning. (12) They suggest that EWLP's use of a great variety of methods and inputs 'may have helped maintain adult interest and attendance thanks to what is technically known as "stimulus variation". Equally important, it perhaps facilitated learning by bringing the teaching/learning process closer to the multisensoral world in which illiterates (like other people) live'.

Correlates of Strategy Factor II

As noted earlier, Factor II is highly correlated with Factor I and significantly and rather highly correlated to all the other factors as well (Table 9.1). As we see now in Table 9.7, this factor is also rather highly correlated to a rich assortment of variables throughout the questionnaire. Like Strategy Factor I, there are significant and *negative* correlations with Barrier Factors I and VI, but this time the B–I correlation is the stronger, suggesting that flexibility and openness may be the best ways to avoid the mire of bureaucracy.

We also note a much higher correlation with the amount of the national financial contribution. We should put this together with the high use of all kinds of media, especially political channels, the participation of all levels, and the heavy use of outside resources: all these things are expensive and require the existence of a large pro-

TABLE 9.7. Correlates of Strategy Factor II: Open Input

Item or variable	Correlation (r)
Barrier Factor I Underestimating the process	-.29
Barrier Factor VI Poor social relations	-.25
Objectives defined with outside help	-.32
Size of national financial contribution	+.38
Use of politically-oriented media	+.38
Acquisition of outside resources (combined index)	+.31
Use of all media (combined index)	+.29
High participation by all levels (combined index)	+.27
Evaluation effort (combined index)	+.24
Total strategies (sum of all factor scores)	+.73

ject; hence a completely open strategy is likely to be the strategy of a large project rather than a small one.

We remain uncertain what to make of this 'strategy' of openness, particularly in light of our earlier exposition on the very problematic 'alternative of grandeur' (chapter III). Perhaps a very open and flexible approach resolves some of these difficulties, but it would still appear that there is a danger of raising expectations far above the level of possible fulfilment. We also may have here the notion of the 'critical mass', the necessity of mobilizing people for change, for getting them excited and energized.

STRATEGY FACTOR III: POWER

Until very recent times, when people thought about making changes, they usually thought about power as the primary means of doing so. They did not necessarily use the word 'power' to describe what they did. The preferred term might be 'law' or

TABLE 9.8. Strategy Factor III: Power – ratings by item

Item	Emphasis*					
	Extreme (%)	High (%)	Moderate (%)	Little (%)	Actively discouraged (%)	No Response (N =)
Clear adminstrative hierarchy for decision making and implementation	16	30	30	19	6	11
Use of directives, laws, rules, procedural manuals	16	25	27	28	3	14
Involvement and direction by top political leadership	18	22	25	25	9	14
Negative sanctions for failure to conform to project procedures or failure to meet specified objectives	4	16	18	47	16	30
Use of specialized agents for communication or provision of technical help	7	28	28	35	3	12

* Percentage of those responding to the particular item. Each row = 100% + or − 1 point due to rounding.

'directive' or 'regulation'; but the underlying idea is the same. Hence Chin and Benne (1969) included a set of strategies which they labelled 'power-coercive' as one of the main classes or models of planned change. We therefore decided to include a set of items in our list of strategies which reflected various aspects of the use of power. Four of the five items we had selected were found to form a very clear factor. These are listed in Table 9.8. The fifth item, 'strong adherence to national goals' failed to load highly on this dimension (see Table 9.3). However, another item which we had not predicted does seem to fit with this emerging cluster.

While the ratings of these items are considerably lower than those for the previously mentioned factors, the amount of emphasis is still considerable, suggesting that a number of projects still rely heavily on this approach.

There are some strong temptations to follow a power strategy of innovation in developing countries. Among these are: (1) the need for co-ordination of effort; (2) the necessity of overcoming inertia; and (3) efficiency.

Of these the need for co-ordination may be the strongest argument and is used, for example, to defend the rather high degree of centralization in the successful ACPO project in Colombia:

> ACPO is administered from central headquarters in Bogota. It has been directed since its founding by Monseñor Salcedo and has experienced continuity and stability of personnel at all levels in the organization.
>
> Some studies of ACPO, especially that of Musto, have been severely critical of the centralized nature of the organization and its program. This criticism is also heard within the ranks of ACPO itself, particularly as one moves from central headquarters to the regional stations and offices.

But here is the justification:

> To ensure coordination and reinforcement of messages disseminated through various media channels, complemented by field personnel, it would appear that a single entity must control the production and transmission of the messages and the training and administration of field personnel. (13)

It is certainly hard to imagine how a complex project with ambitious goals could ever succeed without a set of rules and procedures which everyone was obliged to follow, and this inevitably means surrendering some amount of autonomy. No one would seriously argue this point. The real question is how far one can rely on such mechanisms as the primary or sole means of introducing a change.

There are also a number of instances in the literature which point to the crucial role of a powerful leader in either initiating a project or in cutting through all the red tape of the traditional 'system' to get it moving. Here is but one instance from the Jombang Youth Project case study in Indonesia:

> Earlier, right at the time of the inauguration of the new Bupati, a danger arose of breaches on the embankment of the Brantas river – the longest river on the island of Java – by rapidly rising flood-water. The Bupati then bypassed many bureaucratic hurdles and took it upon himself to find a loan of Rp 900,000 and to organize a 24-hour watch and repair operation for several days to safeguard the embankments. As a result 4,500 hectares of standing crop, the sugar mills, and the iodine factory were saved and the people escaped a disastrous flood. (14)

The example is not specifically related to the innovation in question but well illustrates the kind of power that was held by this person and which was later used to the great benefit of the project.

The third argument for efficiency may be the most illusory. It is often imagined that a project can be moved along faster if laws are enacted or edicts promulgated by those in positions of power. Sometimes and for some things this works quite well.

but it probably works least well for complex innovations (where people do not know what they should do regardless of who orders it), for situations where communication is difficult or slow, and where power is divided, weak or ambivalent. Most of these conditions hold for the case of educational innovation in developing countries. Lallez, for example, in his study of the IPAR project in Cameroon, found that there was almost complete reliance on an administrative hierarchical approach to dictate new behaviours to the inspectorate responsible for implementation of some aspects of the reform. No allowance was made for the fact that the inspectors had a traditional attitude opposed to the spirit of the reform and that time was required to bring about change in such an attitude regardless of rules or laws.

Even in developed countries the efficacy of a power strategy is probably overrated, as Dalin notes:

> Those educational systems which still rely on administrative and legal processes as the only basis for innovation, experience the difficulties of getting these actually working in the system. The process of re-educating persons who will have to behave in different ways if the innovation is to be effective, has to be undertaken. The innovation often requires new knowledge, new skills, new attitudes and new value orientations. It may require changes in norms, roles and relationships. These cannot be dealt with in a coercive way. (15)

There happen to be very few significant correlations which tie this factor to other variables in our survey. As expected, there is a correlation of +.30 with the combined index 'use of politically oriented media'. There is a weaker positive correlation of +.20 with 'average annual outside financial support'. Evidently, outside support sometimes goes to projects which are a bit more regulated or ruled from the top (e.g., the Ministry of Education which is a most likely conduit for outside funds). Of course, it may also be that outside funds come with more strings attached. However, the correlation is too weak for us to spend too much time pondering its meaning.

Finally, we should note a certain reluctance to respond to some of the power-related items on the survey, just as there was a reluctance to respond to the political items in the 'barriers' section. What we see, therefore, may be only the tip of the iceberg. There may well be a tendency to cloak power strategies in the rhetoric of problem solving and participation. Our guess is that this strategy is far more commonly used than is indicated in our data and that the implicit belief in its efficacy remains very strong, especially when projects are having trouble and are facing crises. Most so-called problem-solving or participative strategies stop far short of direct involvement of the learner (see again chapter VII), and until they include the learner as an active partner in the change decision-making process, they cannot claim to be fully participative. Thus in Freire's terms the learners can remain 'oppressed' even in societies which accord full autonomy and indvidual initiative to teachers.

STRATEGY FACTOR IV: DIFFUSION

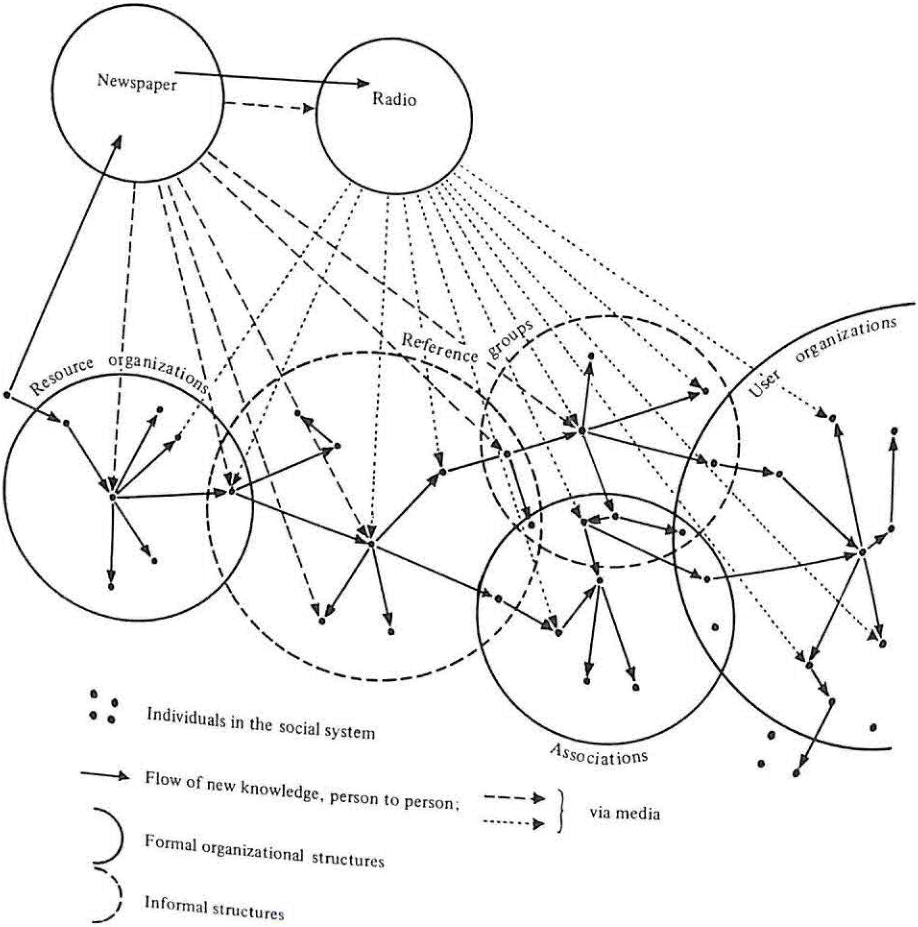
Another view of the innovation process, quite distinct from both problem-solving and power, emphasises the natural flow of new ideas and products throught the social system and between systems. A large body of empirical research supports this communication flow model and has been reviewed thoroughly in several influential works. In particular we would cite the work of Everett Rogers and his colleagues. (16)

Of the many findings which have been reported consistently from the diffusion researchers at least five stand out: (1) that the individual user or adopter belongs to a *network of social relations* which largely influences his adoption behaviour; (2) that his *place in the network* (centrality, peripherality, isolation) is a good predictor of his rate of acceptance of new ideas; (3) that *informal personal contact* is a vital part of the influence and adoption process; (4) that *group membership and reference group identifications* are major predictors of individual adoption; (5) that the rate of diffusion through a social system follows a *predictable S-curve pattern* (very slow beginning followed by a period of very rapid diffusion, followed in turn by a long late adopter or 'laggard' period).

It has long been obvious to students of *planned* innovation that the findings of the diffusion researchers (mostly sociologists although some of the founders of this school were anthropologists) could be used as the basis of a deliberate strategy of change within a culture. Rogers, for example, has been working for some years on the problem of family planning in developing countries, suggesting and evaluating strategies for the dissemination of contraceptive information and devices in various parts of the world.

The orientation of the 'diffusion' strategists can be depicted by a diagram of a social system such as we have presented in the sequence of figures of the imaginary developing country in chapter VII. Figure 41 summarizes the essentials of these figures and represents some of the essential aspects of the strategy.

FIGURE 41. The basic elements of the diffusion strategy



Such a strategy depends heavily on the pre-existence of a *network* of influence in which there are leaders and followers well connected to each other by informal and direct interpersonal channels. The opinion leaders who form the stars in this configuration are more oriented toward external and cosmopolitan (e.g. extra-national) sources of knowledge *and* they are more oriented to taking seriously the messages that come to them from the mass media and other relatively impersonal channels (see chapter IV). The great majority of users, on the other hand, are only influenced to change their behaviour as a result of (1) listening to opinion leaders, (2) observing what they do, and (3) observing the results of their actions (in increased crop yields, improved performance, greater profits, etc.). At the same time, these secondary users and adopters are encouraged, stimulated, and reinforced to follow the leader by repeated messages on the mass media.

In the United States, this process has been reinforced in some sectors, notably in agriculture, by the employment of specialized agents who carried technical knowledge to the consumer, especially the opinion leader, and gave important personal encouragement to experiment with new methods. This 'extension agent' model has been adopted or adapted by a number of developing countries, notably India (village-level workers) and the Republic of Korea.

Taken as a whole, the ideas of innovation diffusion constitute a rather coherent strategy of national development which can be articulated in a few propositions. We attempted to generate such a set of propositions to include as part of our strategy check-list. The results clearly confirm the fact that this is a coherent and distinct view of the innovation process. Table 9.9 identifies the five items which are most clearly associated with this factor. The use of informal *channels* is the most strongly associated item, although it is not the most popular one. In fact, none of these items receives as strong an endorsement as the problem-solving or open input items. We note this despite the fact that there is more research supporting the efficacy of these propositions than any others in our list! The relatively low ratings of these items either suggests a certain lack of sophistication on the part of some of these projects or it

TABLE 9.9. Strategy Factor IV: Diffusion – ratings by item

Item	Emphasis*					
	Extreme (%)	High (%)	Moderate (%)	Little (%)	Actively discouraged (%)	No Response (N =)
Use of informal channels	4	28	36	30	1	14
Techniques of persuasion	6	36	26	30	0	12
Identification and use of formal and informal leaders of opinion	7	33	28	33	0	20
Planned use of mass media to create awareness of the innovation	6	24	34	34	3	13
Organized sub-groups or sub-systems for research, planning, materials development, dissemination, etc.	6	26	38	28	1	16

* Percentage of those responding to the particular item. Each row = 100% + or − two points due to rounding.

suggests a deliberate decision on their part to choose a course which is morally or socially acceptable over one which is pragmatically effective. It should be emphasized, of course, that our informants were not asked to express their own views on any of these items but only to indicate how much emphasis (for whatever reason) was given to each strategy.

The cluster is very much as we had anticipated, with the exception of the last item. Apparently those who adhere to this strategy also see the need for a rather complex division of labour (i.e. infrastructure) as part of the over-all diffusion process.

We do not find too many instances in the literature on educational innovation in developing countries which relates directly to the diffusion approach. The one exception, as usual, is the ACPO project in Colombia which makes extensive use of all the diffusion principles cited and creates an effect not unlike that depicted in Figure 41. As this quotation from Brumberg amply illustrates, first of all a local infrastructure of formal and informal leadership is exploited and strengthened:

> ACPO has developed a network of local parish organizations throughout the country to promote and strengthen its mass media educational programs. Initially, the key figure in the success of such local organizations was the parish priest. "When he [the priest] wishes, there is an organization; when not, none exists." However, since 1965 greater emphasis has been placed on lay leadership at the local level, though in collaboration with the local priest. (17)

Then there is the elaborate use of various media:

> ACPO has adopted extensive mass media techniques to carry its program to all rural Colombians. It owns the largest and most powerful radio network in Colombia (500 kilowatts of radio transmitting power). ACPO also produces high-volume low-cost printed matter in the form of a textbook series with supplementary reading materials, and the largest circulating weekly newspaper in the country. It produces phonograph records, and, most recently, has experimented with tape cassettes. As a complement to the mass media employed, ACPO has developed an extensive network of local workers (predominantly volunteer) and two institutes for the training of rural personnel. Finally, it has encouraged written correspondence as feedback from the rural population to the central ACPO organization. (18)

Then there is direct personal contact:

> Radio messages and printed information are reinforced by personal contacts between ACPO and the campesinos. By means of local staff working in municipalities throughout the country, local volunteers, and the collaboration of parish priests, ACPO has carried its program on a personal level to large numbers of rural Colombians. (19)

The total effect is therefore truly 'synergic'. Several forces of influence are brought to bear upon the campesino in an orchestrated fashion, not only to persuade but to inform and to reinforce learnings and new behaviours. We should note, of course, that the Colombian situation is not at all typical for developing countries as a whole. Many countries simply do not have the minimal existing infrastructure of media and institutions which are essential to carry out this strategy.

Correlates of the diffusion strategy

A considerable number of variables were significantly correlated with an emphasis on the diffusion strategy. The most salient are listed in Table 9.10.

Apparently a larger national contribution is required to use the diffusion strategy and we would expect that such projects, employing media in strategic ways, represent nationwide efforts in many cases. However, there seems to be much less influence and certainly much less outside financial help than one might have expected. Diffusion projects have used outside technical assistance, especially knowledge, but they also and rational division of labour to accomplish the complex tasks of innovation building. However, each separate roleholder must have some idea of how other roles are performed and some idea of what the *linkage system as a whole* is trying to do.

Needless to say, a particular innovation project and its managers will not have much control over what is happening elsewhere in the system (e.g. dotted arrows between other actors in Figure 42), but through their own example of successful linkage they may be able to have some influence over such connexions.

FIGURE 42. The linkage process

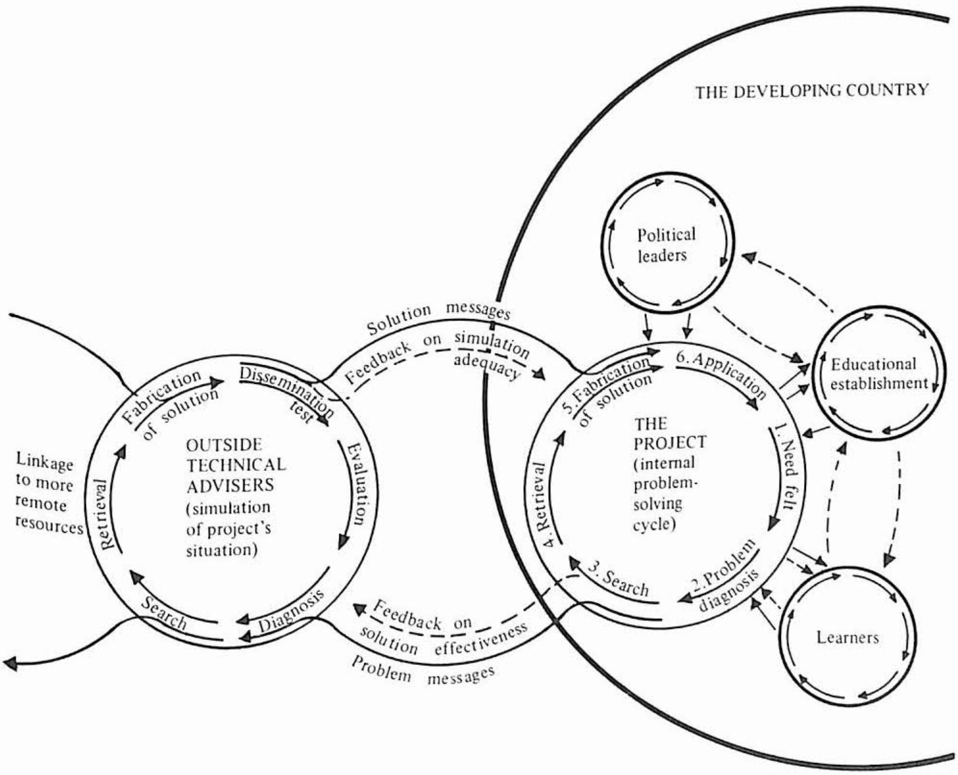

THE DEVELOPING COUNTRY
Political leaders
Educational establishment
Learners
Solution messages
Feedback on simulation adequacy
Feedback on solution effectiveness
Problem messages
Linkage to more remote resources
OUTSIDE TECHNICAL ADVISERS (simulation of project's situation)
Fabrication of solution
Dissemination test
Evaluation
Diagnosis
Search
Retrieval
THE PROJECT (internal problem-solving cycle)
1. Need felt
2. Problem diagnosis
3. Search
4. Retrieval
5. Fabrication of solution
6. Application

TABLE 9.10. Correlates of Strategy Factor IV: Diffusion

Item or variable	Correlation (r)
Size of national financial contribution	+.37
Early replacement of outside personnel	+.32
Early replacement of outside financing	+.23
Originators of the project are nationals	+.27
Acquisition of resources from outside	+.34
Evaluation efforts (combined index)	+.33
Sophisticated resource use pattern (combined)	+.28
Participation of all levels (combined index)	+.27
Use of all media (combined index)	+.27

free themselves from outside dependency at a relatively early stage. We also note a greater effort at evaluation than with other strategies. Finally, it is important to note that this strategy is *not* merely a media strategy, but rather a strategy which uses media and interpersonal contact in integrated ways.

STRATEGY FACTOR V: PLANNED LINKAGE

This last major cluster of items which emerged from our factor analysis represents a set of concepts which we have stressed as very important throughout this book. Thus it is fitting to end our discussion of strategies with these points. Three essential ideas are combined here: understanding the user system; careful planning based on this understanding; and dialogue with the user and with other relevant resource persons and groups.

In many respects this factor reflects Havelock's earlier formulation of the 'linkage' principle, which combines positive aspects of R and D, problem solving and diffusion. Figure 42 suggests some aspects of the strategy in schematic form.

As indicated in the figure, the internal problem-solving cycle and process of each major actor in the system is the essential starting point, but the search for and retrieval of knowledge from outside sources also assumes great importance. However, the assistance or helping activities from whatever source must be co-ordinated with the needs and current situation of the receiver-user of such assistance. Therefore, the outside resource person (or system) must be able to recapitulate or simulate that internal process. Technically speaking, the resource person needs to develop a good 'model' of the user system in order to 'link' to him effectively. Clinically speaking, we would say that he needs to have empathy or understanding.

At the same time, the *user* must have an adequate appreciation of how the resource system operates. In other words he must be able to understand and partially simulate such resource system activities as research, development and evaluation.

In order to build accurate models of each other, resource and user must provide reciprocal feedback and must provide signals to each other which are mutually reinforcing. It is proposed that this type of collaboration will not only make particular solutions more relevant and more effective but will also serve to build a lasting relationship of mutual trust, and a perception by the user that the resource person is a truly concerned and competent helper. In the long run initial collaborative relations build effective channels through which innovations can pass efficiently and effectively from researchers to developers, from developers to practitioners, and from practitioners to consumers. As the RD and D school holds, there must be an extensive

Turning now to our data, we can only expect to find an inkling of this over-all pattern from the items which fall into this set. Table 9.11 displays these items.

TABLE 9.11. Strategy Factor V: Planned Linkage – ratings by item

Item	Emphasis*					
	Extreme (%)	High (%)	Moderate (%)	Little (%)	Actively discouraged (%)	No Response (N =)
Use of various procedures to get feed-back as project goes along	22	43	22	13	0	9
Joint funding by national and international sources	16	46	28	10	0	12
Major effort by project to understand user's actual situation	25	51	14	10	0	10
Careful and specific planning in detail	19	37	28	17	0	9
Clear definition of objectives	26	35	22	17	0	9
Two-way dialogue between project and others	8	40	39	11	1	9

* Percentage of those responding to this particular item. Each row = 100% + or − one point due to rounding.

It is worth noting that linkage principles can be practised even in large projects. Sometimes the model of the leader sets the style for others, e.g. the Jombang Youth Project in Indonesia:

> The Bupati was a great believer in maintaining the line of communication wide open between the people and officials. It was his belief that the way to get the support and participation of people in development programs was to encourage a continuous dialogue between the people and the officials, to keep the people informed of government actions and plans, and to keep himself and his staff fully aware of the needs and problems of the people. Several specific measures were taken to keep the line of communication with the people open.
>
> The Bupati made himself very easily accessible to all segments of the population; anyone could visit him freely on any matter. He constantly invited people from different parts of the district and listened to their ideas on various problems. He frequently travelled to all parts of the district. The administrative staff of the district including the subdistrict heads and village heads were required to visit frequently with village people, inquire about their problems, and find out their opinion on various matters. (20)

Grabe notes that in the Upper Volta project there was no capacity to adapt inputs to specific local needs and conditions:

> Another essential kind of backstopping lies in the area of selecting and adapting the content of instruction. The experience of agricultural extension in general shows that the extension service can be effective only when there is a systematic provision for responding to the changing needs and problems of farmers by validating the extension message and adapting it to the specific situation. The same lesson applies to the REC, but both the Ministry of Education and the Rural Development Organization appear to be unequal to the task. The REC, therefore, continues routinely to propagate certain stock practices and attempts to implement them in the center farm within the limits of its resources, even though the villagers are forced to cling to their own time-tested methods as the best insurance for survival in the face of climatic vagaries. (21)

Another admirable feature of the Colombian ACPO project which we have cited so often in this book is its use of feedback to improve project administration, materials and messages, and to strengthen a sense of community between the project and the people. In fact, it probably comes as close as any example which we have read of the ideal which is expressed in Figure 42. Here is an example:

> ACPO does make use of correspondence in a most imaginative way – making it an effective feedback mechanism. Letters to the radio school (approximately 6,000 per month) are recorded and tabulated by area of the country and topic. The selection of radio program content can then be determined in view of the kinds of information requests received from listeners. All correspondence is answered, either directly or over the air, and the staff of letter writers draws upon the technical various government ministries and research agencies to help them frame replies. (22)

Correlates of the Planned Linkage Strategy

This factor was also found to be related to a moderate degree with several other items and variable in our survey, and these are listed in Table 9.12. Many of these correlates merely reflect the content of the items and hence validate the clusters. In this category we would include the correlations with planning, use of outside resources, evaluation effort and the use of media.

TABLE 9.12. Correlates of Strategy Factor V: Planned Linkage

Item or variable	Correlation (r)
Barrier Factor VI – Poor social relations	-.20
Evaluation effort (combined index)	+.33
Use of all media (combined index)	+.31
Acquisition of resources from outside (combined)	+.30
Use of politically-oriented media (combined index)	+.31
Sophisticated resource use patterns (combined index)	+.30
Emphasis on planning (combined index)	+.29
Implementation plans clear in writing	+.25
Early replacement of outside financing	+.22
Total Strategies (sum of all factor scores)	+.75

It also seems that there is greater concern in this strategy for implementation and evaluation of the project. It should be emphasized that these items and indices are drawn from other parts of the questionnaire than the strategy section and are therefore free from any bias that might enter from response sets.

Lastly we would like to take special note of the very high correlation between Strategy Factor V and the index for Total Strategies. The two variables are, of course, partially confounded since the total index includes the items of this factor along with all the other factors. However, the magnitude of the correlation is the highest of any factor. It suggests a summary point about all these strategies of innovation: that it is important for innovators to pursue a *planned* strategy which takes full account of what is known about the innovation process. This includes being *open and flexible*, being oriented toward the *user's problem-solving process and needs*, making judicious use of *power* where it is necessary and reasonable to do so, and taking full advantage of research on the *diffusion* of innovations in social systems. The optimum strategy takes account of all these elements and orchestrates them, retaining a continuing awareness of what is happening in the user system, making an effort to maintain two-way communication and, above all, remaining sensitive to the people the project is trying to help.

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CHAPTER TEN

Outcomes and evaluation procedures

INTRODUCTION

As stated earlier, innovative projects in developing countries are often characterized by (a) a great number of unexpected outcomes, particularly in the short term, and (b) longer term outcomes which are less durable or widespread than projected in the objectives. These two phenomena are largely due to a disequilibrium between the goals of the education system and its internal capacity to achieve those goals in the manner or the time allotted. The changes desired are often too great or required in too short a period of time for the procedures and resources available to service them.

Of course, explanations for these phenomena are more varied and complex when studied from case to case. Outcomes depend greatly on the type and setting of the project. A catalogue of expected and unexpected outcomes, both during the implementation phase and in the longer run, has been provided in the presentation of the four project types and in the analysis of typical barriers in chapter VIII.

This chapter analyses some typical outcomes and how certain objectives are evaluated – notably those concerning the durability of new elements and behaviours in a project, the transfer of external resources to indigenous finance and personnel, and the extension of a project to a wider public both within and outside the country.

EVALUATING OBJECTIVES

One of the principal difficulties in reporting on educational innovations in developing countries is that of finding reliable evidence of what happened. Locally initiated projects are seldom written about, and when written accounts are available, as is sometimes the case in larger-scale, externally funded projects, they may not be an accurate analysis of the outcomes. The reason for this will be seen shortly. Scientific – in the sense of experimental or ethnographic – evaluations appear to be absent. This limits the validity of many project evaluations, and, at the same time, the validity of synthetic studies such as this one.

Once again, the situation in highly industrialized countries is not radically different, although there is now a definite trend toward more rigorous project evaluation. In a recent, comprehensive review of the American literature on innovation in schools, Giaquinta (1) notes that many evaluation studies judging projects 'successful' were based either on highly subjective and personal accounts from the change agents themselves, or on highly subjective reports from administrators and teachers. (2) Measurement of change by direct systematic observation of behaviour or by the use of control groups and random (or even stratified) sampling was seldom done.

The usefulness of monitoring the results of an innovation is not only to inform others. It is also useful to inform oneself in order that (a) more information be available to improve the project in its next phase, (b) the innovation can be compared to other possible options and (c) that decisions can be made on the extension or generalization of the innovation to other settings. In developing countries where resources are scarce and procedural infrastructure limited in its capacity, these three functions, in particular the last two, are especially crucial. For example, 47 per cent of the projects in our survey sample were classified as 'pilot' or 'experimental' projects. This means that the assessment of their performance on a small scale will determine whether or not the innovation will be implemented in a greater number of institutions or villages or even throughout the country. Careful evaluation would appear to be indispensable. However, we found few reports of innovative projects where either the evaluation was well executed or the conclusions taken seriously. This concurs with the findings of both the Unesco study on the Experimental World Literacy Programme (3) and the ICED team which surveyed some fifteen innovative projects in developing countries. (4) In most cases, this negligence or weakness can be easily accounted for. In others, it is more surprising. Ahmed and Coombs given an example of the latter case in their review of the International Rice Research Institute in the Philippines:

> On the second point (how IRRI graduates utilize their special training after returning home), findings are mixed. It seems ironic that such a distinguished biological research organization would not have undertaken the very modest social science research effort required to keep track of its former trainees when so much was at stake. Somehow the cost-benefit style of thinking that may have entered into the decision to add extension training activity to the research programme seems not have carried over into an assessment of the training programme's performance. (5)

Analysis of instruments and criteria for measuring outcomes

Most of the projects analysed in the Unesco and ICED studies received aid from an external agency, which, in turn, generally *required* some kind of formal evaluation (in order to decide on the value of *its* respective investments.) And yet, even in such cases, evaluation was often cursory. So much the more so, then, for innovations *not* answerable to external agencies. Yet, it has to be assumed that innovators and officials are monitoring the effects of their project in some way which they themselves find satisfying enough.

TABLE 10.1. Mechanisms used and frequency of use in evaluation of teacher education projects (N = 81)

	Mechanism	% of times checked	number of times checked
(a)	Creation of a special unit or group	26	18
(b)	Use of an external expert or evaluator	35	24
(c)	Special periods set aside for evaluation	51	35
(d)	Special meetings	71	48
(e)	Follow-up studies	13	9
(f)	Review of existing data from other sources (census, etc.)	19	13
(g)	Designation of experimental and control groups	10	7
(h)	Clear specification of criteria for evaluation	28	19
(i)	Systematic sampling (random or stratified)	12	8

Continued.

TABLE 10.1. (Continued)

	Mechanism	% of times checked	number of times checked
(j)	Systematic collection of data	31	21
(k)	Questionnaires	47	32
(l)	Review of documents	34	23
(m)	Structured interviews	22	15
(n)	Direct observation of classroom behaviour	47	25
(o)	Direct observation of behaviour in the field	46	31
(p)	Written reports (descriptive)	76	52
(q)	Written reports (quantitative)	57	39
(r)	Oral reports	57	39
(s)	Open discussion	54	37
(t)	Other (please specify)	7	4

Given the multiple checking procedure, grand total surpasses 100 per cent.

In our survey sample, made up exclusively of technically (externally) assisted projects – although the amount of assistance varied widely – respondents were asked to reply whether there was a plan for evaluation and, if so, to check on a list the mechanisms used in the evaluation procedure. The results indicated that in only 8 per cent of the cases was there no plan for evaluation. The mechanisms are listed below with the frequency of use given in percentage form. Items 'h' and 'j' – clear specification of criteria for evaluation, and systematic collection of data – may be taken as good indicators of over-all rigour in assessment.

A first idea of the significance of these data may be obtained by grouping together the five most and the five least frequently used mechanisms.

5 most frequently used mechanisms (in order of decreasing frequency)	5 least frequently used mechanisms (in order of increasing frequency)
1. written reports (descriptive)	1. designation of experimental and control groups
2. special meetings	2. systematic sampling
3. oral reports	3. follow-up studies
4. written reports (quantitative)	4. review of existing data from other sources (census, etc.)
5. open discussion	5. structured interviews

The most frequently used mechanisms can be categorized as either *formal and official* or *informal but presumably official* (oral reports and open discussion). The least frequently used are the more 'scientific' mechanisms. The *frequency* of meetings and reports, combined with the *infrequency* of follow-up studies, suggests that once external assistance is discontinued, so are evaluation procedures. Furthermore, this clear preference for meetings and reports probably indicates that evaluation procedures are quite centralized. This hypothesis is supported by the answers to a question concerning *participation* in evaluation: 57 per cent of the respondents reported participation as being limited to the director and senior staff.

The information in the above table suggests that evaluation is being conducted mainly by means of *inspections* on the part of officials, experts or external evaluators, whose reports are discussed at the provincial or ministerial levels. Senior administrators connected with the project may participate in these discussions, where the report and whatever statistics at hand (numbers of trainees or graduates, use of equipment and facilities, budget expenses, and – infrequently – some kind of data on performance levels, etc.) serve as a basis for assessment and subsequent decison making. Our interview data generally confirm this basic scenario – which would, very likely, hold true as well between experts on a particular project and the bilateral or international agencies conerned.

Without undertaking a detailed analysis of the inadequacies of this type of evaluation, it is important to evoke briefly some of them insofar as such inadequacies may have implications for the future of a particular project or for others related to it. Here, then, is a short list:

- lack of controls (inability to tell whether the outcomes are attributable solely or principally to the project or to influences outside the project);
- *post hoc* nature of assessment (using final outcomes as the basic criterion without having made initial or even periodic measures; in some cases, the evaluation is carried out well after completion of the project);
- limited information, since the number and types of measures are also limited, few people are consulted, and few people carry out the evaluation;
- bias, since those responsible for the evaluation are often also involved in the project and therefore can be reluctant to reveal certain negative outcomes;
- danger of primary reliance on quantitative measures, which are partial and often misleading indicators.

To illustrate the last two points, it is interesting to cite first from an interview with an African project director:

> Evaluation is usually done through a report by the project director. I have done several of these. It is only fair to say that this is not an objective or systematic type of evaluation. After all, we know that a project will be judged 'successful' if the report is positive and well done, and we're personally interested in a positive evaluation. Even when outsiders are used, they usually rely on us and on one or two staff offficials for most of their information.

And from a Latin American adviser:

> I have been in situations where it is just impossible to have a report which is an objective evaluation [for] political or psychological reasons.

The limitations of heavily or exclusively *quantitative* assessment are pointed out in this commentary:

> This project is judged successful . . . , but in my opinion it is so on quantity of materials produced, teachers trained and the rigorous speed at which it has advanced. It is very questionable whether the new curriculum is widely used, and whether it actually meets the learners' needs more than the old. (6)

Similarly, de Wilde concurs with the critique of Lynton and Stepanek on an Indian non-formal education project, writing that there was a tendency 'to evaluate technical advice in a number of units visited and people seen, not in terms of results'. (7) Finally, from an interview with a government official from the Arab States:

> We are systematic in reporting to the UN Development Programme [officials] every six months. It is a quantitative report which also goes to the government. But we also need and we do not have a qualitative evaluation of the teachers' performances or their attitudes. These are also important objectives in our projects.

The dilemma here is that the most important quantitative measures (e.g, results of achievement tests) are almost never available, and the qualitative measures are not being sought. This means that most information for the evaluation comes from (a) the opinions of officials or experts, and (b) statistical data such as the number of students trained or materials produced – and this may have little or no relevance to the objectives of the project. The purpose of avoiding such shortcomings would not be to facilitate judgements on whether an innovation was 'good' or 'bad' but to get reliable information which could be useful in a number of settings. In our sample, a project judged to be 'good' on the basis of whatever evaluation was carried out is likely to be implemented in a similar way elsewhere or on a larger scale. If the information is unreliable, these other projects may be expected to run into more numerous or more serious problems since the plans were based on inaccurate data.

Several of the projects in our sample which appear to have been 'successful' – in terms of meeting their own specified objectives as well as in terms of other criteria such as subsequent growth, smooth implementation, creation of similar or more extensive innovations as a result of this project, replacement of external finance and personnel, etc. – are characterized by a serious attempt at rigorous and responsive evaluation and, in some cases, by a fairly elaborate infrastructure for assessment. This is not true of all projects, most notably the small-scale or locally initiated innovations, where it is possible to survey a more limited field with a multitude of informal but fairly sensitive measures. Nor do we mean to imply that a project cannot succeed without amassing quantifiable data: there is a long list of rigorously evaluated programmes which have failed to meet any of their objectives. We do suggest, however, that projects with sensitive measures of their own ongoing process and short-range outcomes are likely to be spending more time and energy attaining the project objectives than on extracting themselves from a series of unforeseen obstacles. If such projects are imitated, continued or generalized, their subsequent phases are likely to be based on more accurate information.

The point will be made by presenting analyses of evaluation procedures in two innovations, which have been often cited in this study: the Colombia ACPO (Acción Cultural Popular) project (a multimedia rural education programme) and a Caribbean regional curriculum development and teacher education project. First, a citation from Blumberg's anaysis of the ACPO programme:

> A programme as complex and extensive as ACPO's requires considerable feedback to gauge whether its objectives are being realized.
>
> Through a system of statistical reporting, examinations, correspondence, and special research projects, ACPO has tried to monitor results and, in turn, adjust programmes to meet the needs and interests of the target audience. However, because this audience is remote and widely dispersed, the monitoring of results has been extremely difficult. (8)

For the Caribbean project, we have put data from their project evaluation report on to the matrix used for the survey analysis. Although there is some additional information included on the frequency and timing of the mechanisms used, this is basically the same matrix as that presented in Table 10.1. This profile is noteworthy for the *number* of different mechansims used – far more than in most other case studies, project reports, interviews or survey responses. Also important is the fact that several of these measures are used periodically or continuously in order to provide *feedback* in the ongoing project. Furthermore, three very important mechanisms are used; clear specification of criteria, systematic collection of data and direct observation of behaviour in the field. It will be noted that the more 'scientific' instrumentation – experimental and control groups, systematic sampling – is *not* employed, but that the necessary instrumentation for systematic and precise action research is.

TABLE 10.2. Profile of evaluation mechanisms used in the Caribbean regional curriculum development project

	Used	Beginning only	End only	Beginning and end	Periodically	Continuously
creation of a special unit or group	✓				✓	
use of an external expert or evaluator	✓				✓	
special periods set aside for evaluation	✓				✓	
special meetings						
follow-up studies*						
review of existing data from other sources (census, etc.)						
designation of experimental and control groups						
clear specification of criteria for evaluation	✓					
systematic sampling (random or stratified)						
systematic collection of data	✓					✓
questionnaires	✓					✓
review of documents						
structured interviews						
direct observation of classroom behaviour						
direct observation of behaviour in the field	✓					✓
written reports (descriptive)	✓				✓	
written reports (quantitative)	✓				✓	
oral reports						
open disucssion						
other (specify)						

* planned but not yet begun

Finally, it will be interesting to look at analyses of evaluation procedures in two other innovations, an Algerian functional literacy project and the Pan African Institute. Both projects received very positive evaluations from their authors:

> The Algeria project was one of the few among the experimental projects that made a serious attempt at evaluation. However, the evaluation studies suffered from a lack of continuity and sophistication and are, at best, inconclusive as to the effects and/or benefits of the project.

> Although it is clear that those illiterates who stay with the programme for two years achieve about fourth- or fifth-grade reading, writing and mathematical skills, there is only scant information conerning their use of these skills, no information on their retention of them, and little information (mostly opinion surveying) about their acquisition of new behaviours and utilization of new technical skills which affect their personal lives or productive patterns. (9)

> Finally, other African institutions would do well to follow the example of the Pan-African Institute in the field of evaluation and follow-up: the director and secretary-general talk with employers to evaluate the graduates' work and the training experience of the Institute. They also keep in relatively close contact with the graduates themselves. Most interesting is the manner in which such contact is kept: not merely by a questionnaire, which lists the graduate's position and whereabouts, but in a context of sharing developmental ideas and advice. The *Bulletin* informs graduates of the status of other graduates and also provides a forum for further communication about development problems. In this way, the *Bulletin* works to upgrade former students. (10)

Reasons for the lack of more extensive or more reliable evaluation

We shall now discuss why there is not more and more reliable evaluation of short-range or long-range outcomes. We shall explore two levels of explanations: first, those which seem most apparent and, then, some of the less visible but very likely more signficant reasons.

Apparent explanations

Cost. Evaluation, notably systematic and scientific evaluation, is costly both in financial terms (personnel) and in time. For large-scale projects, there is the added cost of providing an infrastructure for processing and analysing large amounts of data. In a number of projects, costs are invoked as principal reasons for the absence of evaluation. (11,12) In others, evaluation is carried out only when supplementary funds are provided from outside the country. (13) Woodhouse and Lubis provide both an example and a pertinent commentary:

> Like most educational programmes, particularly those that are locally initiated and operated on shoestring resources, Jombang has not been very conscious about the importance of systematic evaluation of its activities and maintenance of records on what happens to its clientele. However, its major achievements, problems and signficance are probably sufficiently visible. (14)

Lack of trained personnel. This is an obvious and frequently mentioned factor in the case study literature and in the interviews. To illustrate, here is a quotation from an interview:

> Normally, there is very little evaluation in the projects, even in the large ones. Even where there is money for it, few people are qualified to do it.

Insufficient data base. It is difficult to measure outcomes when baseline data are not available. This weakness is mentioned in several cases in the Unesco assessment of the Experimental World Literacy Programme, (15) and the main point was clearly made in one of the interviews:

> We can't evaluate at the end of a project if we haven't planned to do it from the beginning.

In the evaluation report on a large-scale African rural education project, the author claims that not until one year before the end of the project was it discovered that (a) the initial and desired performance levels for students were not known; (b) there were no operational criteria for measuring the differential effects of participating schools; and (c) provisions for evaluating the experimental school materials had not been made. Consequently, the principal measure chosen for evaluation was the quantity of production of new educational materials. As a last example, here is a remark by Prosser in connexion with the attempt of the ICED team to assess the outcomes of a Jamaica out-of-school training project.

> The effectiveness of the YDA programme to 1972 is impossible to quantify. One group of objectives clusters around the personal development of the camper. These include good character development, the development of leadership qualities, a sense of civic and community responsibility, self-discipline, and attitudes to facilitate their continuing intellectual and technical development. No studies exist on the progress of campers as they left, nor was the stage of development of individual campers known before joining. (16)

Unclear objectives. This problem was studied earlier in connexion with the origins of innovations. Often, objectives are left intentionally ill-defined so as to be acceptable to all parties concerned. Otherwise, the project – particularly if it is on a large scale – might never get past the phase of needs assessment. In other instances, unclear objectives are the result of a rapid, superficial planning process. In either case, precise evaluation of outcomes is very difficult, even when there are sufficient baseline data. It is simply impossible to look at all the outcomes if no clear priorities have been set in the objectives.

Scale, haste and diversity of the target population. As has been seen throughout this study, projects are often put together very rapidly to be implemented on a large scale for very diverse publics who are sometimes not even identified in advance. This is a nightmarish situation for evaluation design specialists, contributing greatly to the difficulty of finding out what has happened, why or how it has happened and what is likely to happen next. To cite from two relevant studies:

> Several visits to the project have left little doubt as to its dynamism, uniqueness and general value. At the same time, because of the highly variegated, local and pragmatic character of the project, it has been exceptionally difficult to secure systematic data on such matters as costs and finance, the number of participants in various activities, and follow-up of the participants. (17)

> Indeed, considering the limitations of resources, the briefer time span, the non-selective nature of the clientele, and the broader scope of the objectives, any comparison of the REC with the primary schools only on the grounds of literacy and arithmetic is unfair. (18)

Less apparent explanations

Instability. One of the chief assumptions of formal or 'summative' evaluation is that the initial objectives and baseline data will be the critical references for measuing outcomes. However, if the initial objectives change often and new baseline data are not systematically collected, there is no use in evaluating the success with initial objectives nor much opportunity to prepare for measuring the success of the new ones. Yet this very situation is common in many, if not most, of the innovative projects studied here. Projects in our sample are characterized by a high degree of instability: there are changes in decisions, involving subsequent changes in orientation, changes in personnel and adminstrative structures, a substantial number of unexpected outcomes, etc.. To a great extent, these are the *conditions* under which all innovations are carried on, and it is reasonable to expect that evaluation procedures will adapt to these conditions rather than the reverse. The assumption that no evaluation is possible without a pre-established, fixed goal is unreasonable in view of the fact that people and institutions constantly devise new goals for themselves and shift priorities as a condition of their existence. In this context, Corwin (19) makes the important point that organizations are usually faced with constraints beyond their control. Seldom is power sufficiently concentrated to allow for the kind of internal control needed to implement a project as planned or even to permit a well controlled study of it.

Difficulty of quantifying the most important objectives. Referring back to an earlier citation from Prosser concerning the Jamaican Youth Education Programme, it will be noted that an important group of objectives clustered around the 'personal development of the camper': 'good character development, development of leadership qualities, sense of civic and community responsibility, self-discipline. . .'. These are elusive and ambiguous goals, and their evaluation is perilous. On the one hand, they are difficult to quantify. Once they are quantified (e.g., attendance at community meetings, voting record, position of local responsibility), much of the initial objective is lost in the atomization of relevant indices. In addition, it is *impossible* to attribute changes in personal behaviours and attitudes solely to an educational intervention, unless it takes the form of a prolonged, intense treatment to the near exclusion of other environmental effects. For example, in looking at one of the principal goals of the Colombian ACPO project – 'the development of a national consciousness and sense of national identity' on the part of campesinos – we are not surprised to see evaluators throw up their hands and centre on some more basic and more easily measurable indices such as the simple survival and growth of the programme.

> Given the objectives of the programme, most of which are not primarily economic, and their long-term nature, a cost-benefit judgement is difficult to make. That the programme has survived and grown for 24 years strongly suggests, however, that benefits are being realized by campesinos. The sale of publications, enrolment in radio schools, radio-listener correspondence, number of volunteers workers, and volume of campaign projects realized indicate acceptance over many years and, indirectly, that campesinos view ACPO's efforts as beneficial. (20)

Unevaluated outcomes. One of the criteria used to evaluate the success of innovations is their capacity to further or precipitate other changes in the education system. These 'spin-off' effects are often very difficult to predict, but they are sometimes more far-reaching than the outcomes of the innovation itself. By limiting the evaluation to pre-determined objectives, these longer-term secondary outcomes are ignored.

We have the impression that many of the projects in our sample, and even those judged problematic, are rich in their secondary effects on the people or institutions affected by them. These may, in fact, be their most important aspects, since the short-term objectives are often limited in scope. Three examples are given below.

> The organizational objective of self-financing a substantial portion of expenses appears to have had an interesting effect upon the institution. It has resulted in a greater awareness of programme budgeting and planning. There also seems to be a greater cost consciousness than would normally be found in an educational organization and considerable pressure exerted to reduce programme costs wherever possible. Maintenance of equipment and inventory control, which were noted above, are examples of attention to costs and the general business-like attitude found within the organization. (21)

> ACPO's policy of training rural young adults to serve as local staff for one- to two-year periods and of using local volunteers has resulted in a considerable spin-off of trained and experienced people who, according to ACPO, generally remain in their rural communities. They provide a much needed leadership pool, serving as both indigenous organizers and local opinion leaders. (22)

> An incidental though crucial benefit of the post-school group has been its effect on the RECs themselves. A successful group effectively demonstrates by example the usefulness of rural education; it can put pressure on the village chief to see to the REC's good functioning; it can help motivate the teacher who is the main pivot of the system; and it can exercise surveillance over former students through the development of an *esprit de corps.* (23)

Unfamiliarity or inappropriateness of evaluation instruments. Systematic or scientific research is more than a series of procedures or instruments. It is also a special way of looking at social interactions. It is an epistemological view of how we can 'know' what is happening in schools or with adult learners in ways that assure our knowledge is neither subjective nor unreliable. To objectify our ways of obtaining information, we may tend to 'objectify' (i.e., make into objects) the people about whom we obtain that information. For example, the assumption behind random sampling is that a group of people chosen at random are typical of anyone else in the large population from which they are chosen. Questionnaires include items designed to control for bias, i.e., untruthful responses. A 'control' group does not receive any of the same advantages as an 'experimental' group, although it may urgently need a similar treatment. Systematic observation assumes that people cannot precisely or reliably recount what they are doing, etc.

There is some indication that many of these assumptions are not accepted in countries included in our sample, often on ethical grounds. There is also a latent epistemological debate on the validity of scientific research in social settings, which we have sensed in a number of our readings and interviews. Apart from this larger problem, we note that many of the standard evaluation procedures are unreliable in many situations, notably those which avoid face-to-face contact. We cite below a pertinent illustration from a project evaluation report of an Asian educational broadcasting programme:

> One of the difficulties ... as regards listener research and evaluation in general is that it cannot be conducted in any written form. Experience clearly shows that, for example, the circulation of listeners' questionnaires is quite unreliable and often extremely misleading. A test of the questionnaire approach, which is usual procedure in most countries, proved disastrous. Ninety per cent of the answers received gave a glowing report of the broadcasts which on closer scrutiny proved to be inaccurate. Assessment can only be done by systematic visits to listening groups.

Limited use of evaluation data for decision making. We have already suggested that decisions to start, continue or expand an innovation are based less on reading evaluation reports (impersonal sources of information) than on the project director's, minister's or political leader's own convictions or the opinions of their closest advisers (personal sources of information). This point was put very succinctly by one of the most experienced technical advisers in our interview sample:

> Evaluation is often a very nice exercise for the sake of the exercise. It doesn't tell very much to people inside the project that they didn't already know, and it doesn't have too much influence on the decisions that are taken at a higher level.

To some extent, the fact that evaluation data are little used as a basis for decision making is attributable to the *delays* in providing these data and the often unreadable *form* in which they may come. Evaluators are typically careful to qualify their conclusions, often doing so in what is perceived as hermetic language. Administrators want to make clear choices and to make them rapidly on the basis of brief, accessible and unambiguous information, and this, an evaluation can seldom provide. Administrators and political leaders, who make almost all of their decisions on the basis of partial or highly ambiguous data, typically expect that 'scientific' evaluations will yield unequivocal results.

However, the main point is the simple fact that people make decisions most often on the basis of previous convictions. When new information contradicts those convictions—the convictions being a slow accumulation of prior information which has formed a reliable and secure pattern of explanation for most of what one observes—it is ignored or distorted. This is the familiar phenomenon of 'cognitive dissonance'. An example of this is the fact that many educational innovations are political acts of faith, that is to say, they are often not politically tolerable as failures and will typically receive additional support and resources until some form of success is assured. The evaluation, then, will tend to be used if it is either favourable or at least aligned with the opinions of key people associated with it, and will be disregarded at least by these same individuals–if it is unfavourable or dissonant.

This would explain in part the absence of a more energetic attempt from within the project or the country at more rigorous evaluation procedures. It should, however, be mentioned again that the phenomena of under-utilization of evaluation results is not limited to developing countries. To end this section, here is a revealing commentary on this subject from the Rand team which surveyed a large number of contemporary educational innovations in the United States.

> We have not discussed student outcomes as a factor affecting continuation. In the projects we visited, project evaluation evidence did not seem to play an important role in decisions to continue or incorporate project strategies. Where project outcome data were used to support such decisions, they were apparently applied to justify a decision that essentially had been made on other grounds. For example, one Right-To-Read project will be continued because the superintendent is highly committed to the project focus and treatment–even though there is now no objective evidence that participation in the project does anything for students' reading scores. Another Right-to-Read project (Adamston) is unlikely to be continued even though it has shown dramatic gains in reading readiness skills and reading decoding skills. District administrators cited lack of effect on comprehension scores as a reason for probably not continuing the project.
>
> In sum, we were struck by the absence of reference to evaluation outcomes in the project sites we visited. On the whole, district and project staff appeared to view evaluation as a necessary ritual, which was tied to the continuation of federal funds but was not important for their own continuation decisions. (24)

REMOTE (LONGER-TERM) OUTCOMES

Although there are few rigorous or even detailed studies of the longer-term effects of innovations in developing countries, what information we have collected from the case study literature, and, in particular, from the interviews with experienced advisers and their national counterparts, is concordant. In general, these data confirm one of the chief hypotheses of this study: long-term–and often short-term–effects are typically less widespread or less intensively institutionalized than was either stipulated in the project objectives or judged to be the case during the life of the project.

Very often, projects initially aiming at a major reform within the formal or out-of-school educational network ended up by abandoning that objective in favour of a more modest goal, e.g., the implementation of one or more experimental projects. We have tried to show that this kind of outcome is due primarily to the disproportion between initial goals and the capacity of the infrastructure to deal with them. In the long term, once external resources and support have been removed, these innovations revert to a scale and form which the infrastructure and environment *can* absorb and service.

At this point, we would like to look more closely at typical outcomes for two objectives frequently mentioned in our sample: the transfer from external assistance to indigenous staffing and finance and the extension or diffusion of small-scale experiments to a wider public.

Transfer to indigenous resources

One of the principal ways to make a major breakthrough in the education system is through the mobilization of sufficient forces over and above what is required for the routine functioning of that system. In a country where those forces (persons, materials, facilities, administrative support and services, and funds to acquire more of all these) are inadequate, there is recourse to external assistance to provide some or most of them. The idea is that the innovation will entail a *reorganization* of the system and that this will gradually free enough internal forces so that responsibility can eventually be taken over from external sources. This hypothesis also operates within education systems in highly industrialized countries which depend on national or federal assistance for launching local innovations. In some cases, *part* of the external assistance is maintained, in order to facilitate a more gradual transfer of responsibility.

The vulnerability of this strategy is that 'break-through' innovations are *artifacts*. They represent changes in the education system which would not normally occur and they are artificially kept alive by special energies, funds, expertise and other additional personnel and facilities. They are, in the theoretical jargon, 'temporary systems' and 'protected subcultures'. The key questions thus become: what happens when the protection disappears and the temporary system is absorbed into the permanent system? How can this be done in such a way as to *preserve* the changes, yet to *integrate* them into the rest of the education system?

We have already shown that the more ambitious or complex the changes, the longer it will take to learn or integrate them in a stable manner. Thus the basic contradiction is between *rapid* and *massive* change in a long-term perspective, i.e. massive changes can be rapidly *initiated*, but they cannot be rapidly *adopted* on a stable or permanent basis. This is due to the fact that a system—be it individual, an institution or a series of individuals or institutions—cannot assimilate rapidly a great number and variety of new elements or behaviours which are unfamiliar or unpractised. If the assault is massive, there will be an attempt to reject the changes. If adoption is obligatory, there will be a process of superficial conformity. This is the same dilemma as that between centralized and decentralized change. In the first case, massive and rapid changes can be decreed and initiated, but the rate of *stable* implementation is typically poor. Decentralized change is typically very slow and limited, but implementation is far more stable.

This leads to two conclusions. The first is that rapid and massive changes will only be possible if the temporary system is extended over a *long* period, i.e., external assistance must be maintained in large enough amounts over a long enough span of time to allow for very gradual integration. The second conclusion is that projects should be scaled down in complexity or ambition so as to stay within the capacity of the education system to absorb them and be modified by them in the sense and degree indicated by the project's objectives.

There is also a third conclusion, which combines the two previous elements into an alternate strategy: projects should be *initiated* with a low to moderate level of ambition, and external resources should be used principally to extend the project to other sites or to increase its scale on the original site. The theoretical arguments above, together with much of the evidence we have sifted through, would lead us to favour this strategy (see chapter VI) and we shall examine some of this evidence in the following section.

Support for the first two conclusions (extended support or reduction of scale) comes from a number of sources. In their summary of African case studies, Sheffield and Diejmaoh appear to conclude in favour of continued external support.

> In most cases, external assistance is more in the form of expert personnel than equipment. Such assistance was usually given for a limited period, at most five years. The viability of projects after external assistance is withdrawn is far from certain, especially when expansion is attempted. In some cases, as in the Bako project in Ethiopia, sound projects have been abandoned for lack of continuity in external assistance. The financial basis of many projects that receive external aid is shaky and more attention must be given to finding a more viable basis of support. (25)

The following commentary, in relation to a Latin American project, makes the same point:

> The project terminated as planned this fall. It is generally considered to be very successful. However, some doubt has been expressed to me in private by the project officer and one expert as to whether the use of the extensive multi-media centre and of materials production equipment and *skills* will continue now. They suspect that the 15 governments of the region cannot contribute enough money for supplies, equipment maintenance and personnel to keep the innovation in operation.
>
> In this regard, it can be said that ... [external] money and expertise are indispensable to the continuation, as well as to the introduction of the innovation, and that without such outside assistance, the new teacher training practice might not survive.

The first part of Schramm's summary on innovations in educational media, cited below, illustrates support for the second alternative—that of reduction in scale.

> None of these projects could have gone forward successfully without substantial support—financial, logistic and technical—from outside. This raises the question of whether such 'forced feeding' is the best way to encourage national educational reform, or whether a similar, less expensive method supportable largely by local resources, might be more lasting even if somewhat slower. (26)

Schramm's suggestion reflects our own bias toward a strategy of initial small-scale innovation followed by more ambitious diffusion. As indicated earlier, locally initiated or supported innovations report a very high rate of replacement of whatever external assistance they can mobilize. Such innovations can also stay in tune with real needs more easily than can a large-scale project. Finally, wider diffusion built on the foundation of a tested experience seems to us a more solid base than widespread initiation of an innovation with which few people have had any prior experience.

Achieving autonomy: basic theorems and survey data. We need now, however, to deal with the basic question of how a person or institution takes over responsibility for a task which had been dependent on external aid. The underlying model is very much the same as one in learning theory, psychodynamic change theory or in theories of institutional and social change. We shall use it here to review examples of projects which transfer responsibility to indigenous personnel and finance.

Schematically, three types of conditions, listed below, must be met in order for a project to become successfully autonomous:

(a) *Provision.* There must be provision for a period when special energies or resources will no longer be as numerous. This generally involves some continuing support along with increasing integration within the former system.

(b) *Gradual preparation.* The new skills, behaviours or structures must be tried out and exercised so that the moment of independence is not overly brutal. An attempt should not be made to make more or more difficult changes than *can* be tried out and exercised.

(c) *Confidence or commitment.* There must be confidence that the person or institution will be able to function successfully without undue dependence on external aid. This will also increase the commitment to the changes being made. Confidence and commitment are naturally heightened if there is provision for some continued support and time for successful practice of the new skills or structures.

The survey results provide an approximate image of the *type* and *degree* of autonomy achieved in developing countries. In our sample of teacher education projects, 91 per cent of the respondents reported plans to continue the project after external assistance had terminated. Below are the (percentage) figures concerning replacement of outside personnel and finance.

Table 10.3. Replacement of external personnel and finance.

	No replacement %	Replacement planned but not implemented %	Replacement partially implemented %	Replacement fully implemented %
Replacement of outside technical personnel with nationals	6	44	38	12
Replacement of outside financial assistance with national	19	41	30	11

These figures are somewhat deceptive, however, since a planned replacement may not be implemented simply because the project is not yet completed or has been only recently completed. It is more meaningful to relate rates of replacement to other important variables—e.g., project type, origin of the project, amount of external aid, degree of comprehensive planning, type and seriousness of barriers encountered, etc., and this has been done in previous chapters. Therefore, the only really useful information to be derived from this table is that replacement is more often provided for personnel than for finance and that in one-fifth of the cases, continuing finance is not being planned for.

From previous analyses, we have seen that replacement is more often implemented when the originators of the project are all or mostly nationals, when there is a high proportion of *national* financial assistance and when levels of ambition are low or moderate. There is also some indication that careful planning is associated with partial or full replacement of external assistance. Once again, there are commonsense interpretations to be made: people or institutions follow through more responsibly on projects which they themselves have designed and to which they themselves are committed, especially when they plan them carefully and are not too ambitious in what they expect of themselves.

Responses to another survey question, shown below, are potentially more significant, albeit equally problematic to interpret.

To what extent has the quality of the project altered with termination of external assistance?

%

29 - Improved greatly
17 - Improved slightly
25 - Remained about the same
25 - Declined slightly
4 - Declined sharply
0 - Project terminated with termination of outside assistance

This is the type of question which internal judges are likely to be biased in answering since they are normally both committed to and identified with the project. Not surprisingly, the *interviews* and project evaluation reports yield a less optimistic picture. One interesting aspect is the relatively high rate of 'slight decline' (although the term itself is ambiguous) which is *admitted* on the part of external advisers and national officials.

To give some more clear-cut illustrations of typical responses to this question, we cite two interesting passages, (a) from an interview with a team comprising an adviser and ministry official, and (b) from Ahmed's analysis of an Asian farmer education project.

> We hope that the project will go on without the [external] director. But it will probably be less structured, and things will not be done as systematically. Some of the people aren't so enthusiastic about the changes, and the ministry has other projects to get off the ground and give its attention to.

> The basic concept of integrating messages delivered via radio, films, and printed materials with the current programme objectives of ORD and with the day-to-day efforts of guidance workers was sound and imaginative, but the practical application of this concept left much to be desired. Budget stringencies had seriously curtailed the production of up-to-date films, for example; hence the messages still being delivered were likely to be in some cases obsolete. There had been few if any systematic audience studies to evaluate the effectiveness of radio programmes, films and other materials or to guide producers in fitting future programmes to the primary needs and interests of the intended audience. The technical quality appeared to vary considerably, with some of it distinctly inferior. For instance, some 8-mm films made for a mobile unit for presentation to villagers contained out-of-focus shots, were badly scratched, and suffered from poor sound quality.
>
> The over-all impression of the ICED research team was that the audio-visual operations were not sufficiently integrated with other ORD educational and information efforts and that they had suffered a decline in priority and support since their heyday when they enjoyed strong support from AID. (27)

Testing the theorems for achieving autonomy. We shall now look more closely at the three postulated pre-conditions for achieving successful autonomy presented in the previous section. We consider this to be a very critical discussion, part of which was taken up in our earlier analysis of the conditions for successful adult learning and change.

Planning and providing for follow-up. Where communities, institutions or ministries have made provision for the period when external support will be absent or drastically reduced, there is evidence of successful implementation of the innovation. Ideally, such provision should be naturally built into the environment itself. When there is no existing provision for follow-up, we can legitimately ask whether the innovation corresponds to the situation in which it is being implemented.

To give some examples, we cite first from the ICED analysis of an apparently successful, locally initiated Asian project in vocational training for out-of-school youth:

> The distinguishing feature of the training activities in Jombang is that they do not end with just training. The Pramuka and the respective government agencies continue to maintain contact with the youth and provide assistance in utilizing the skills in profit-making enterprises. Such enterprises include growing cabbage and potatoes; raising chickens, ducks, and other animals; growing fish; running shops for small repairs, for making tiles and bricks; and running co-operative rice-hulling mills. The educational programme thus comprises a vertically integrated process with several steps: identifying the educational need, designing a training experience, carrying out the training, combining it with practical and productive experience, and continuing assistance in production, raising capital, marketing, and so on, to ensure utilization of acquired skills. (28)

In other words, an essential ingredient of successful adoption is the degree to which practical applications and further occasions for learning are available in the environment after the project is completed. This is the crucial question in most literacy programmes, where occasions for maintaining and increasing the acquired skills are often lacking.

Peer support can be an important help during the period when the project is gradually acquiring autonomy. Apart from administrative assistance, the creation and maintenance of a 'reference group' is often an effective device. These are people who have been involved in the innovation and who can call on one another for help and sympathy. Somethimes, in fact, such groups constitute an unexpected but positive secondary effect for a project which was not so successful during its period of execution. To illustrate, here is the IEDES analysis of an African rural education project:

> The IEDES team concluded that, although retention of learning among former students of rural education three to six years after their leaving the centre is on the whole poor, there was sufficient evidence that, where post-school groups existed, the situation was showing marked improvement. The mere fact of belonging to a post-school group appeared to be of fundamental importance for a former student. IEDES found that the only students of rural education to have maintained or even enriched their knowledge were those who were members of these groups, managed by former students in conjunction with the teacher and village notables. Moreover, they were the only ones who took the initiative to organize themselves and participate collectively in the supplementary courses. These young adults displayed an extraordinary sense of dynamism and a spirit of invention.
>
> In 1968 a government decree recognized the formation of post-school groups as an integral part of the new rural education system and by 1972 approximately 60 new groups were active, though mostly in the Yatenga district. (29)

Below are two illustrations of typical outcomes when the follow-up phase was not adequately prepared:

> Another weakness in the project design is the lack of provision for subsequent development of secondary education in this region. This project has made an important beginning, but what does it lead on to? (30)

> Q. What will happen when you leave?
>
> A. There will be 120 school buildings completed or with annexes. There will be *physical traces* but, for the rest ... well, there was a good critical review of the programme, but no one provided for follow-up from within the country or from the UNDP. (31)

Gradual preparation for taking over responsibility. In numerous case studies and interviews, the decline in a project after termination of external aid is attributed to a lack of preparation for that moment. Either national funding is not made progressively available, or external advisers continue to direct the project and to man all the crucial posts. Owiredu, in analysing the African Social Studies Programme, gives a good account of this oft-repeated scenario.

> The Programme was started as a result of funds made available by the Ford Foundation for effective but not total programme support over an initial period of two years. This Foundation also provided funds for the maintenance of a small Secretariat ... Unfortunately, no arrangements were made at the outset whereby member countries would contribute to the support of the Secretariat or undertake definite responsibility. This was a weakness in the system since it meant that the Programme had to depend largely upon foreign donor organizations for support of the Central Organization. If this Programme was to have an essentially African direction, then financial commitment, however limited, for the support of the Secretariat by the member countries would have been in order. Foreign donor organizations are under no obligation to continue supporting the Programme indefinitely and unless a system is evolved to get a regular source of funds, the Programme will cease to exist when foreign funds no longer come in. (32)

'Inadequacy of the level of financial support contributed by the country' constituted a serious problem for 52 per cent of those responding to this survey question, and it was an equally serious problem in 73 per cent of the project evaluation reports. Other indices suggest that this may not be entirely due to a lack of internal resources. For example, locally initiated projects did not report this problem as often as did larger scale projects. There are some projects where, when external assistance is high, national funding goes, and stays, elsewhere. Such a pattern may signal a lower level of *commitment* on the part of the national officials or institutions toward externally originated and funded projects. Other sources (33) make the same interpretation. By the end of the phase of external funding, so little internal finance has been made available to the project that it becomes budgetarily impossible to take over the costs of continuation. Schramm suggests that the non-continuation of the well planned and extremely well tested Niger ITV project followed this pattern.

But continued funding or material resources are only one part of the problem. It is just as imperative for nationals to learn and practise the skills necessary to the innovation. In this way, they are able both to build up personal involvement with the project and to prepare themselves for taking over execution from the external experts. This point is well put in the following evaluation report of a Latin American project:

> The results of the project, achieved entirely within the ongoing systems of education and training, have been used and will therefore continue to be used as part of them ... The training of counterparts [was] genuinely and directly aimed at the transfer of initiatives within the life of the project.

And from an interview with a Latin American official:

> I am very optimistic about the programme's continuing after external funding is cut off. For example, a lot of the key personnel have already been absorbed in the School of Education as regular staff.

Confidence and commitment. It appears opportune to open the discussion on this subject with a provocative quotation from an interview with an African planning official:

> When US aid was discontinued, we went to Unesco and Unicef for help ... There was a problem of not really committing our own money, so we never got that involved ... And we may have used experts too much. We didn't build up our own competence enough ... Sometimes, there is a sort of complex that the *real* expertise is only *outside* the country–[it can only be found in] experts or our own people who are trained abroad.

Basically, this strategy of assistance is problematic, since it works against the effective transfer of responsibilities to indigenous personnel. Part of this strategy is the quest for the 'best experts available' to aid with execution of the innovation. To cite a ministry official from the Arab States:

> We try to get the best experts available–we try for deans or heads of departments in reputed universities. Anyone the government recruits has written 6-12 books.

The dilemma here is that the country is likely to–literally–turn over the problems to the experts. The hidden assumptions are (a) that the competence within the country is not equal to solving them; (b) that someone *else* will be able to solve *our* complex problems. This argument is, of course, implausible. The expert can solve nothing by himself, and he will in any case let the country cope with its problems at some point. The dilemma is *increased* by communicating to the experts this heavy investment in their roles. This may lead them to do more by themselves in order to live up to the hopes invested in them. Thus is created a self-fulfilling prophecy: the belief that only the best expertise can aid in bringing about the necessary changes, invests the experts with the power and responsibility for doing so. This confirms the belief that only *they* have the necessary competence. When the experts leave, the local personnel feels–with justification–unprepared to take over responsibility. This becomes another confirmation of the impression that local expertise is incompetent, and there can be a subsequent arrangement to bring in more external expertise ... Or, as one of the most experienced technical advisers in our interview sample put it:

> If you treat the national counterparts like irresponsible children, they become just that. You do all the work and then you leave and they try to live up to their reputation and you might as well not have come in the first place.

To a great extent, since it is not the *institution* which spontaneously asks for its autonomy, the behaviour of the expert or director becomes essential to achieving this autonomy. Here, it is less the expert's competence in his field than his pedagogical and psychological sophistication which is decisive. This comes out in the following interview with a Latin American official:

> Q. What did the technical adviser do that was so good?
>
> A. He had the ability to translate a lot of theory into a practical solution. He didn't talk about it; he helped people develop talents that made them find the solutions. He could get people to participate in this process completely ... He got people to realize that they had strengths ... [He also put into place a system whereby] there were as many as four counterparts per expert ... For example, some of these counterparts were 'co-tutors'. They actually produced materials along with the expert ... Later, they were able to do it without him.

It is, of course, not an easy task for a director or expert to accept as an indicator of success the fact that he is not needed to direct or advise. A good deal of empirical research suggests that few leaders *can* in fact tolerate this situation, and that they tend either to extend the period of dependence if they remain or, if they leave, to threaten the capacity of the innovation to survive without them. (34)

Extension from the pilot phase within and outside the country

Unfortunately, we have more information on how innovations are initiated and implemented in one site than on attempts to generalize them to other settings. In a certain sense, of course, much the same adventure can be lived over in each of the new settings, so that the patterns we have already studied will be repeated here. When extension takes the form of major administrative implementation, the same cycle occurs as that described in chapter III and chapter IV. Similarly, when the strategy utilized is that of a gradual, indirect diffusion to local settings, the sequence of events and constellation of intervening factors correspond to the small-scale or locally initiated projects described earlier.

The difference, of course, lies in the fact that a pilot project constitutes a trial or experiment furnishing important information about the best conditions in which such a project could be implemented elsewhere. In our survey sample of teacher education projects, 47 per cent were characterized as pilot experiences. In 53 per cent of these cases, plans had been made to establish similar projects in other parts of the country. In 13 per cent of the cases, action had already been taken to establish similar projects in other countries.

We have seen that these 'pilot' projects are often very ambitious, and that they constitute more of a full-scale attempt at innovation than would a closely controlled experiment. When this is so, the same phenomenon of scale is likely to occur at the generalization phase. As one experienced project director commented on this point in the interviews:

> There is a particular problem when we move from the pilot phase to the generalization phase. There is just nowhere near enough preparation to deal with the problem of *scale* ... One assumes that all that is needed is three or four times the staff and money and equipment and then no more preparation than that is made ... Sometimes, even when there are not these kinds of resources for extending the project, there is a tendency to go ahead anyway.

The citation brings out well the combination of factors reviewed in previous chapters: ambition, rapidity, minimal planning, tendency to implement 'administratively' without prior study of or negotiation with people and institutions in local settings, lack of sufficient resources, etc. The problems may even be more acute if–as appears to be the case in many projects–external assistance has been heavily used for the pilot project and is not available, or is only available in limited quantities, for the (more significant) phase of extension.

Successful pilot projects may even exacerbate the problem. When they have succeeded in one site, impatience to solve national problems takes on new force. Thus, there is the risk of rushing feverishly into widespread application without prior planning or negotiation. Criteria for extension become exclusively administrative since these are the easiest criteria to implement through the existing infrastructure. This can lead to the dangers of (a) generalizing on the basis of a single project carried out in a particular local context and (b) generalizing in a different way (e.g., with non-volunteers, through administrative rather than local power structures) than in the pilot phase. A typical case in point appears in Augier's account of the extension of the rural technical training centres in the Ivory Coast. The sequence of events here merits close study:

> The first centre was set up at Gagnoa by agreement with the villagers' groups. The pupils were designated by the villages and came to the RTC for two years' comprehensive training. Training was given to those with some ability in woodwork, metalwork or in working with concrete. After training they returned to their village and became, according to the needs of the moment, craftsmen or planters. This experiment was successful and steps were therefore taken to extend it by starting eleven new Rural Technical Centres. But these centres never attained the success of the first one ... Why?
>
> First of all, they were set up without a thorough preliminary study of employment opportunities and often for reasons of local prestige rather than for technical reasons ... The villages were no longer systematically consulted on the choice of candidates, the entrance examination at CM2 level was taken by pupils practically of *cinquième* standard. The selection rate was such (40 places for 125 candidates) that the best, recruited on the basis of a strictly scholastic type of competitive examination combined with psychotechnical tests, were generally pupils from the *sixième, cinquième* and *quatrième* classes who were unable to continue their secondary education because they were too old to do so, for example. (35)

The apparent paradox here is that the techniques used successfully to implement the initial project were abandoned in the generalization phase. The obvious explanation is an impatience to generalize without having to spend large amounts of time on pre-planning and consultations. Once again, the dilemma between centralized (direct) and decentralized (indirect) modes of implementation is posed, and it can be seen from another perspective in the Unesco assessment of the Experimental World Literacy Programme.

> A major paradox results from the Government's strong support of functional literacy as 'the' method to be employed in its national campaign. While in general government support seems to be an essential component of project success, functional literacy programmes by definition must be tailored to the economic and literacy needs of specific groups. In an economically and culturally diverse country such as the Sudan, it is questionable whether the financial, administrative and technical problems of mounting a *national* functional literacy campaign, following the pattern of the experimental project, can be overcome. (36)

In some cases, the error lies in seizing upon pilot projects which, *although* successful, cannot feasibly be generalized. A number of out-of-school innovations belong in this category. This is illustrated in the following quotation from the Marga Institute's assessment of a rural education project in Sri Lanka:

> A viable approach to training in agricultural occupations for the large number of rural youth who will live on the land is yet to be found. The settlement scheme, a qualified success at best, is too expensive and its expansion is limited by the scarcity of easily reclaimable land. The Young Farmers Clubs, like their counterparts in many countries, serve mostly as social and recreational

> outlets for youths. The small, church-sponsored training programmes for young farmers have proved more effective mainly because they select the most motivated learners, provide intensive practical training, and gear the training to specific employment opportunities. It is doubtful if these programmes can be successfully expanded and, even if they could be, it is by no means certain that there would be sufficient economic opportunities for a large number of these trainees. (37)

Intra-regional generalization. An important but seldom studied variable in the diffusion of innovations can appear when it is a question of diffusing it in the immediate neighbourhood of a pilot project. There is often more reticence here than elsewhere, and officials tend to grow impatient with that reticence. Since the local conditions appear to be very similar and the region belongs to the same administrative district, there is a tendency to generalize first in that region and to do so with a minimum of prior negotiation. Rational as that strategy may appear, it often creates more problems than it solves. The Rand study on recent educational innovations in the United States mentions some of the reasons for this.

> What is notable about intra-district diffusion of change agent project strategies and materials is how little of it there was ... This apparent indifference seemed to stem from an unwillingness to acknowledge the accomplishments of their neighbours or to admit that someone else in the district with roughly the same problems and resources was doing a more effective job. Project staff also reported that other teachers and principals in the district saw the project as a threat. (38)

Strategies and diffusion. We have pointed out some problems involved in the strategies of generalizing 'administratively', often by beginning with the region in which the pilot project is found. We have also indicated the potential interest of more indirect, 'socially interactive' techniques of diffusion in order to extend innovations beyond their original settings, often into other countries. To be sure, the success of such a strategy depends on a number of key variables: similarity of needs, permeability to solutions from without, access to information about the innovation, power dynamics within the new setting, etc. However, there is evidence that, although these 'socially interactive' techniques are not widely used, they contribute to a high rate of stable adoption when they are. (39, 40)

One final characteristic of the generalization strategies studied here merits a brief commentary. Before pilot projects are extended, national officials often arrange for directors or officials at the new sites to visit the original site in order to familiarize themselves with the innovation. There is some evidence that this strategy, although a logical one with some obvious advantages, can often have less positive secondary effects. Greenwood *et al* point out some of these and argue for an alternative approach:

> The reportedly successful dissemination strategies we encountered were structured so as to reduce the perceived threat and the perceived irrelevance of 'exemplary' projects. These projects sent travelling teams (which in the classroom organization projects included parents as well as teachers and administrators) to districts that had expressed interest. These travelling teams tried to help local districts design and implement their own projects and did not tell them what to do in detail. In other words, they tried to help districts build their own innovative capacities, and did not try to install a replica of their own model.
>
> Change agent project staff felt that this 'travelling circus' approach worked much better than visits to the innovative project from the staff of other districts. Visitors to a demonstration site seemed to feel threatened. They often saw the accomplishments of the project as 'overwhelming'. For example, visitors remarked that they couldn't imagine how the project could be carried out in their own district. (41)

Another advantage of this approach, often observed in empirical studies, is that the travelling team becomes more committed to the positive effects of change in its own setting when it interprets or 'sells' its project elsewhere. The process of communicating one's satisfaction may make the advantages of change seem more real. Lippitt *et al* provide a good, final example.

> ... a community which had inaugurated a new community council was rather ambivalent toward the value of the new feature until representatives from neighbouring communities began to ask questions about the advisability of establishing similar councils. Then, of course, the citizens became aware of their status as the possessors of a new and valued facility. The result was that their indecisive feelings about the community council vanished, and they became fully committed to the usefulness and value of their change effort. (42)

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40. Cf., Ahmed, M; Coombs, P. 'Philippines: training extension leaders for promoting new rice varieties', in: Coombs, P.; Ahmed, M. *op. cit.*, p. 577-78, in particular the example of diffusion to Sri Lanka.

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ANNEX: QUESTIONNAIRE PREPARED FOR THE SPECIAL PROJECT ON INNOVATION PROCESS, SEPTEMBER 1975

Summary of teacher training project experience

As one method of summarizing the experience of many experts and field workers in different projects, we request your co-operation in responding to the following questions.[1] Most questions can be answered merely by checking the response column which most closely corresponds to your personal judgement or observation. Try to answer all questions which apply to your current project and base your answer on project experience up to the present time. If, however, the project is only in its first half-year, or if you feel you are minimally informed on its operations, please use the *last* project you were involved with in responding to all the questions below. If you do not understand a question, indicate by placing a question mark (?) beside the response box. If you feel the particular question has no application to your case, write 'NA' beside the response box. If you would like to comment or qualify your response to a particular question indicate by writing 'C' beside the response box. You may write your comment on the side of the page opposite the item. In any case please do not leave any response boxes blank without some comment or notation.

---

[1] *Attention:* This material is to be reported with strict anonymity. It is important that you tear off the cover page and retain the number of the form until the feed-back discussion later in the conference.

1. IDENTIFICATION DATA

To be used only for summary analysis and subanalysis by type of project. All responses will be reported anonymously and no identifying data will appear in any reports derived from this material.

1. Geographic region ....

1.2 Very brief project description (5-10 words) ....

1.3 Your present role in the project. ....

1.4 Year project began ....

1.5 Year project will terminate ....

1.6 Source of outside financial assistance. ....

1.7 Level of financial assistance (approx. U.S.$)
Project total: ....
Current year: ....

National contribution (approx. U.S.$)
Project total: ....
Current year: ....

1.8 Approximate number of persons to be trained:
In total life of project: ....
In present year: ....

2. AWARENESS AND DEFINITION OF NEEDS AND THE SETTING OF OBJECTIVES

2.1 From what persons or groups did the idea for this project come originally?..........
....

2.2 How strongly was the need for change felt by different groups?

	Very strongly	Strongly	Not too strongly	Not at all	Need for change disputed by
Technical experts from other countries and international organizations.					
Technical experts native to the country.					
Political leaders					
Educational leaders and officials ...					
Members of the project team					
Teachers					
Present teacher trainers.					
Present teacher trainees					
People as a whole					

2.3 Was the need clearly defined and understood by different groups?

	Very clearly	Clearly	Not very clearly	Not at all defined or understood
Project team				
Political leaders				
Educational leaders and officials ...				
Teachers				
Trainees				

2.4 What media were used to *express* the need? (Check all which apply.)

	Frequently	Once or twice	Never
Formal report published and distributed			
Newspaper articles			
Political speeches			
Radio programmes			
Television programmes			
Leaflets			
Large public meetings			
Small group discussions			
Other (specify)			

2.5 By whom was the need or problem analysed within the institution?

☐ By director, with directives to staff

☐ By staff

☐ By trainees

☐ Other (specify)

2.6 Were needs transformed into a set of objectives for the project?

☐ Very precisely

☐ Fairly precisely

☐ Defined in general terms

☐ Vaguely defined

☐ Not defined in any formalized way

2.7 Was this done through the *usual* mechanisms of the institution or through the creation of a *special* mechanism?

☐ Usual

☐ Special

2.8 Was outside help used to define the objectives?

☐ Task was performed exclusively by outside technical experts

☐ Mostly by outsiders

☐ Inside-outside collaboration

☐ Mostly insiders

☐ Entirely by insiders

2.9 Was there consensus on the objectives within the institution?

☐ Yes

☐ No

If no, please explain briefly:. . . . .

2.10 Were the objectives modified during the project?

☐ Yes

☐ No

If yes, please explain how and why: . . . .

2.11 In your opinion, were the official objectives of the project realistic?

☐ Extremely high and unobtainable as originally stated

☐ Very high and probably unobtainable

☐ Very high but obtainable

☐ Moderately high and obtainable

☐ Not very high

3. THE PLANNING PROCESS

3.1 Was there a distinct period in this project which could be called the 'planning phase'?

☐ Yes, very distinct (approx. dates from . . . . to . . . .)

☐ Yes but not very distinct

☐ Planning occurred throughout, not a distinct phase

☐ Very little planning at any time

3.2 Were plans for *implementation* clearly specified in writing before the beginning of the project?

☐ Yes, clearly and in great detail

☐ Yes, clearly but not in detail

☐ Yes, but not clearly

☐ No, there was no real plan issued as a document

3.3 Was the plan for the project ever revised?

☐ Major revisions made frequently

☐ Major revisions made once or twice

☐ Only minor revisions

☐ Plan was not changed at all

3.4 Did the project adhere closely to the written plan?

☐ Deviated significantly

☐ Deviated slightly

☐ Adhered fairly closely

☐ Adhered strictly

4. ACQUIRING PROJECT-RELEVANT TECHNICAL KNOWLEDGE

4.1 What different sources were used to obtain technical knowledge for the planning and implementation of the project? (Check all which apply.)

Source	Effort expended to acquire knowledge			Usefulness		
	High effort	Some effort	No effort	Very	Somewhat	Not at all
Experts from outside the country. .						
Experts within the country						
Site visits to similar projects in other countries						
Site visits to similar projects within the country						
Documents on similar projects in other countries						
Documents on similar projects within the country						
Teachers and teacher organizations.						
Professional staff of existing teacher training organizations						
Books and documents on various aspects of teacher training						
Books and documents on education for development.						
Other sources (specify).						

4.2 Was acquiring technical knowledge considered to be an important aspect of the project?

☐ Extremely important

☐ Somewhat important

☐ Not at all important

4.3 In its present form, woud you describe this project as innovatory?

☐ Entirely new and original, not based on outside technical knowledge.

☐ Represents a mixture of new and old ideas from inside and outside.

☐ Represents a mixture of new and old ideas but almost entirely generated within the country.

☐ Is primarily an adaptation of concepts and procedures already half understood and implemented in at least one other country.

☐ The project is not primarily innovatory but rather represents a continuation, expansion or duplication of programmes already well established within the country.

5. HOW VARIOUS PERSONS AND GROUPS WERE RELATED TO THE PROJECT

5.1 How were political leaders involved? (Check all which apply.)

☐ Participated actively in all major phases.

☐ Made key decisions.

☐ Were represented on project working teams.

☐ Were represented on advisory groups.

☐ Made speeches in support of project.

☐ Had little involvement.

☐ Involved but in other ways (specify) . . . .

5.2 How were educational leaders involved?

☐ Participated actively in all main phases.

☐ Made or participated in key decisions.

☐ Were represented in project working teams.

☐ Were represented on advising groups.

☐ Had little involvement.

☐ Involved but in other ways (specify) . . . .

5.3 How were teachers involved in project?

☐ Teacher representatives participated in all phases.

☐ Teacher representatives participated in key decisions.

☐ Teachers were represented on project working teams.

☐ Teachers were represented on advisory groups.

☐ Had little involvement.

☐ Involved but in other ways (specify) . . . .

5.4 How were members of the community involved in the project?

☐ Community representatives participated in all phases.

☐ Community representatives participated in key decisions.

☐ Community representatives participated in working teams.

☐ Had little involvement.

☐ Involved but in other ways (specify) . . . .

5.5 Were there other persons or groups involved in a significant way that should be mentioned?

. . . .

5.6 *See following page.*

6. POTENTIAL DIFFICULTIES IN THE COURSE OF A PROJECT

A number of situations may cause difficulties for a project at various times. A difficulty may be a delay, a shortage, a conflict or a problem of some kind. Many such difficulties are normal and predictable and most may be easily overcome. Nevertheless, because experts differ on the relative importance of different factors, it would be most useful to have your judgement of these areas in the light of your specific field experience. Topics are listed in seven major groupings including geographic, historic, socio-cultural, political, economic, procedural and personal. There is also some necessary repetition and overlapping of questions.

We would like you to judge the potential seriousness of each of these difficulties by checking the appropriate box after each item. For each set of items first rate the 'in general' summary item, then the separate subitems. Also please add your own items if you feel this list is incomplete.

	Extremely serious	Very serious	Somewhat serious	Observed but not serious	Not observed by me
6.00 *Geographic factors in general*					
6.01 Long distance between places					
6.02 Slow transport of materials					
6.03 Isolation from other countries which are involved in similar projects					
6.04 Climatic conditions which make work difficult					
6.05 Persons who should have been involved in the project (as trainees or in other capacities) were difficult to locate and recruit					
6.06 Other geographic factors (specify and rate seriousness).					

6.10 *Historic factors in general*					
6.11 Colonial rule left a vacuum of leadership					
6.12 Colonial education system was very inappropriate for needs of the country.					
6.13 Colonial rule left the country very suspicious of foreigners.					

5.6 What means were used to inform different groups about the project? (Check all items which apply.)

		Personal discussions	Small group discussions	Large open meetings	Speeches	Radio	Film	Newspaper stories	Formal reports	Other (specify)
Overall level of use	Frequent									
	Occasional									
	Never									
Intended audience:										
	Political leaders									
	Educational leaders									
	Directors of examination units									
	National curriculum development centres or units									
	Teacher educators									
	Text book boards									
	Teachers									
	General public									
	Students									

	Extremely serious	Very serious	Somewhat serious	Observed but not serious	Not observed by me
6.14 Ruling élites traditionally opposed to innovation or to expansion in education sphere					
6.15 Struggle for independence left the educational structure in disorder					
6.16 In the struggle for independence many technically qualified teachers and teacher educators left the country					
6.17 Other historic factors (specify and rate seriousness)					
6.20 *Social and cultural factors in general*					
6.21 There was conflict among ideologies about change					
6.22 There was a poor climate for sharing ideas openly					
6.23 There was inadequate social harmony and good relations among project team members					
6.24 There were problems in social relations between team members and others					
6.25 There were significant language barriers to be overcome					
6.26 There were significant differences in cultural values					
6.27 There was poor attendance at project meetings					
6.28 Other social or cultural factors: (specify and rate seriousness)					
6.30 *Political factors in general*					
6.31 Disputes among different political parties or factions					
6.32 Objections to project by special interest groups					
6.33 Lack of interest by political leaders					
6.34 Certain key political leaders were opposed to project					
6.35 Lack of understanding of project by political leaders					
6.36 Lack of good communication with political leaders					
6.37 Educators on project did not understand political realities					

		Extremely serious	Very serious	Somewhat serious	Observed but not serious	Not observed by me
6.38	Drive to nationalize education makes use of outside technical assistance more difficult					
6.39	Changing governments makes it more difficult to maintain consistent policy and to follow plans					
6.40	Pressure from political leaders to produce results in too short a period of time					
6.41	Fear that the project might have results which would disrupt the existing political situation					
6.42	Other political factors (specify and rate seriousness).					
6.50	*Economic factors in general*					
6.51	Inadequacy of level of financial aid from outside the country					
6.52	Inadequacy of level of financial support contributed by the country					
6.53	Inflation threw original cost estimates completely off					
6.54	Costs were generally underestimated even without considering the effect of inflation					
6.55	Project funds were mismanaged					
6.56	Project funds were poorly allocated to different aspects or phases of the project					
6.57	There were significant delays in the delivery of funds					
6.58	The economic condition of the country as a whole					
6.59	National economic priorities were on other areas than education					
6.60	National economic priorities were on other areas within the education sector					
6.61	Project team lacked understanding of economic realities in the country					
6.62	Results of the project did not appear to have sufficient advantage in economic terms					
6.70	*Procedural factors in general*					
6.71	Formal authority to begin project was delayed					

		Extremely serious	Very serious	Somewhat serious	Observed but not serious	Not observed by me
6.72	There was a lack of clear lines of authority					
6.73	There was insufficiently clear structure for decision making					
6.74	There was too much decentralization of decision making to different groups					
6.75	There was too much centralization of decision making					
6.76	There was not enough co-ordination of people in different roles.					
6.77	There was a lack of *common understanding* of project objectives					
6.78	There was a lack of *agreement* on project objectives					
6.79	Outside technical assistance was faulty.					
6.80	Materials for the project were of poor quality					
6.81	Materials for the project were in insufficient quantity					
6.82	Materials for the project were not ready or not delivered on time					
6.83	There was a lack of skilled manpower to implement the project as planned .					
6.84	The departure and replacement (turnover) of key persons in the project happened too quickly to preserve continuity					
6.85	The project was implemented too quickly.					
6.86	The project was implemented too slowly					
6.87	There were too many rules and regulations which had to be followed.					
6.88	There was inadequate consideration of problems of implementation					
6.89	Other procedural factors (specify and rate seriousness).					

6.90	*Personal factors in general*					
6.91	Persons in key roles did not devote enough energy and enthusiasm to the project					
6.92	Persons in key roles were not open to change their attitudes or behaviour. .					
6.93	There were insufficient rewards for those who would be implementers . .					

		Extremely serious	Very serious	Somewhat serious	Observed but not serious	Not observed by me
6.94	There was a lack of persistence by advocates of the project					
6.95	There were personality conflicts among various members of the project team					
6.96	Some key persons were too rigid and narrow in their understanding of the project					
6.97	Some key persons were too loose and broad in their understanding of the project					
6.98	Some project members lacked understanding and appreciation of the feelings of others					
6.99	Other personal factors (specify and rate seriousness).					

7. PROCEDURES FOR ON-GOING AND FINAL EVALUATION OF THE PROJECT

7.0 What is the current status of your project regarding evaluation?

☐ Evaluation completed

☐ Evaluation in full progress

☐ Evaluation planned and initiated

☐ Evaluation has been planned only

☐ Evaluation is in process of being planned

☐ There is no plan for evaluation

If evaluation is not complete, answer all the questions below on the assumption that the plan has been carried out.

7.1 Was the project monitored or evaluated by *existing* mechanisms, by *new* mechanisms or by both?

☐ Entirely new

☐ Mostly new

☐ Equal mixture

☐ Mostly existing

☐ Only existing

7.2 Were they mostly *informal* (for example, discussions between staff members or between director and staff members) or *formal* (staff meetings, reports, workshops, analysis by special unit or person)?

☐ Mostly informal

☐ Mixed

☐ Mostly formal

7.3 Who participated in meetings, discussions or decisions concerning evaluation?

☐ Director only

☐ Senior staff

☐ Others (specify) . . . .

☐ All staff

☐ Staff and students

7.4 Which of the following mechanisms were included in the evaluation procedure? (Check all which apply.)

	Yes, was used	If used, at what time?				
		Beginning only	End only	Beginning and end	Periodically	Continuous
Creation of a special unit or group						
Use of an external expert or evaluator						
Special periods set aside for evaluation						
Special meetings						
Follow-up studies						
Review of existing data from other sources (census, etc.)						
Designation of experimental and control groups						
Clear specification of criteria for evaluation						
Systematic sampling (random or stratified)						
Systematic collection of data						
Questionnaires						
Review of documents						
Structured interviews						
Direct observation of classroom behaviour						
Direct observation of behaviour in the field						
Written reports (descriptive)						
Written reports (quantitative)						
Oral reports						
Open discussion						
Other (please specify)						

8. EXTENSION, DISSEMINATION AND TRANSFER OF PROJECT ACTIVITIES

8.1 Was the project originally conceived as a pilot project or an experiment to be introduced on a trial basis?

☐ Yes ☐ No

8.2 Are there plans for continuing the project after external assistance has terminated?

☐ Yes ☐ No

8.3 Are any of the following procedures planned or implemented?

	Planned	Partially implemented	Fully implemented
8.31 Replacement of outside technical personnel with nationals			
8.32 Replacement of outside financial assistance with national			
8.33 Establishing similar projects in other parts of the country			
8.34 Distributing reports of project results within the country			
8.35 Increasing the number of persons trained .			
8.36 Establishing similar projects in other countries			

8.4 To what extent has the quality of the project altered with termination of external assistance?

☐ Improved greatly

☐ Improved slightly

☐ Remained about the same

☐ Declined slightly

☐ Declined sharply

☐ Project terminated with termination of outside assistance

9. What was the strategy of innovation? It is very difficult to provide a satisfactory summary of the strategies and operational philosophies of so many diverse projects. However, many of the following items have been recommended by various experts as important elements in a sound strategy of innovation. Which elements received emphasis in your project?

	Emphasis				
	Extreme	High	Moderate	Little	Actively discouraged
9.01 Self-help: belief that people ought to be able to solve their own problems with minimum outside interference or assistance.					
9.02 Maximum use of local resources.					
9.03 Local control, participation, decision making					
9.04 Responsive to local needs, customs, desires					
9.05 Wide latitude for individual initiative and choice at the local level.					
9.11 Strong adherence to specified national development goals					
9.12 Involvement and direction by top political leadership					
9.13 Clear administrative hierarchy for decision making and implementation					

		Emphasis				
		Extreme	High	Moderate	Little	Actively discouraged
9.14	Negative sanctions for failure to conform to project procedures or failure to meet specified objectives					
9.15	Use of directives, laws, rules, procedural manuals					
9.21	Maximum use of all resources, national, local and outside					
9.22	Search for new ideas from as many people as possible					
9.23	Use of many media and many procedures for participation.					
9.24	Broad definition of goals.					
9.25	Openness to recycling the project, redefining goals and procedures as circumstances change.					
9.31	Clear definition of objectives					
9.32	Careful and specific planning in detail					
9.33	Use of research; systematic retrieval of information					
9.34	Evaluation in quantitative terms					
9.35	Organized sub-groups or sub-systems for research, planning, materials development, dissemination, etc.					
9.41	Use of informal channels.					
9.42	Techniques of persuasion					
9.43	Identification and use of formal and informal leaders of opinion					
9.44	Use of specialized agents for communication or provision of technical help					
9.45	Planned use of mass media to create awareness of the innovation					
9.51	Joint funding by nationals and outside experts					
9.52	Joint funding by national and international sources.					
9.53	Two-way dialogue between project and others.					
9.54	Major effort by project to understand user's actual situation.					
9.55	Use of various procedures to get feed-back as project goes along					

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A wide-ranging theoretical study stemming from the convergence of the two authors' work in this area published between 1969 and 1973. Basically, it is an attempt to apply a systems analysis approach to educational innovation in developing countries. It goes beyond the metaphysics and phenomenology of innovation, however, drawing both on case studies and on theoretical literature to confirm the authors' own research findings: they interviewed a representative sample of education officials and administered a questionnaire to responsible persons involved in teacher education projects. The result is a series of detailed explanations of the various ways in which innovation as a process may function, not only as a system but also in terms of its ecosystem. Conclusions are drawn which should facilitate the management of future innovations. The book will thus be invaluable to educational policy makers and research workers concerned with innovation.

ISBN 92-3-101527-3